

Defining Mixed-use along Honolulu's Transit System within the Context of the Urban, Neighborhood, and Suburban

Ted Gerald Kekoa Onishi
May 2008

Submitted towards the fulfillment of the requirements for the D. Arch Degree

School of Architecture
University of Hawai'i at Manoa

D. Arch Project Committee

Kazi Ashraf, Chairperson
Peter Flachsbart
Donald Goo

Defining Mixed-use along Honolulu's Transit System within the Context of the Urban, Neighborhood, and Suburban

Ted Gerald Kekoa Onishi
May 2008

We Certify that we have read this D. Arch Project and that, in our opinion, it is satisfactory in scope and quality as an D. Arch Project for the degree of Architecture Doctorate in the School of Architecture, University of Hawai'i at Manoa.

Architecture Doctorate Project Committee

Kazi Ashraf, Chairperson

Peter Flachsbart

Donald Goo

Table of Context

Abstract	01
Chapter 1: What is Mixed-use?	02 – 05
Chapter 2: History of Mixed-use	05 – 11
Chapter 3: Suburban Living	11 – 14
Chapter 4: Opportunities and Advantages of Mixed-use	15 – 18
Chapter 5: Mixed-use Case Studies	19 – 34
Chapter 6: Why Mixed-use in Honolulu?	34 – 38
Chapter 7: Project Sites	38 – 50
Chapter 8: Design	50 – 60
Chapter 9: Conclusion	60 – 68
Drawings	
Ewa – DWG A1	
Ewa – DWG A2	
Ewa – DWG A3	
Ewa Section	
Downtown Honolulu – DWG B1	
Downtown Honolulu – DWG B2	
Downtown Honolulu – DWG B3	
Downtown Honolulu Section	
Mō'ili'ili – DWG C1	
Mō'ili'ili – DWG C2	
Mō'ili'ili – DWG C3	
Mō'ili'ili – DWG C4	
Mō'ili'ili Section	

Bibliography

Illustration credits

Abstract

My interest in mixed-use began when I questioned the purpose of projects or buildings that function as a single-use. For example office buildings that are built for administrative personnel and conference rooms would bring greater profit to users and owners if shops and restaurants were included into the building program. There is greater land-use efficiency with properties that include multiple uses within a single development. A mixed-use building has a range of economic and social benefits for users and owners.

In order to gain a better understanding of mixed-use, I have studied numerous California and New York City resources on the subject and received an internship with two architecture firms on the mainland that have experience with this complex building type. I also had the pleasure of visiting a few mixed-use projects while living in San Francisco and New York City.

In this paper, I have researched historical mixed-use examples from Mesopotamia, China, and Rome. In addition, I examined several contemporary mixed-use projects: Flatiron Building, Rockefeller Center, Unite d'habitation in Marseilles, Beijing Looped Hybrid, and Tokyo Midtown.

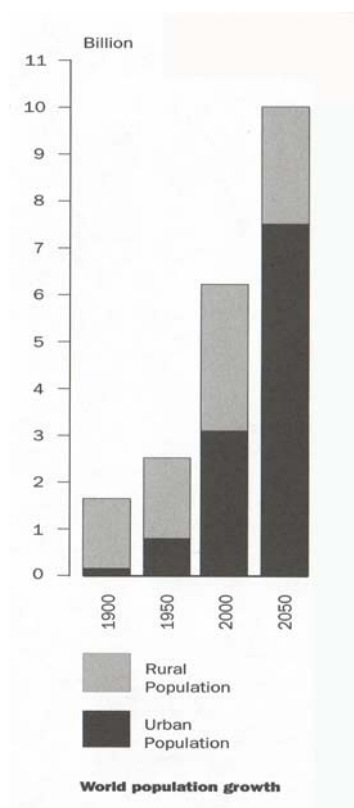
Mixed-use projects bring opportunities and advantages for the community. In general mixed-use developments foster social and community gathering, provide a higher standard of living, and offer economic benefits for public and private entities.

In Hawaii we are blessed with beautiful weather and unique scenery found nowhere else in the world. Like other cities, Honolulu is growing in population. This population requires additional resources to support it. Homes, jobs, and transportation are needed to help sustain our growing population. Honolulu is currently at a pivotal point in its history. Honolulu is faced with a transportation and housing crisis. How will Honolulu respond to the future growth in population? Mixed-use and an efficient transit system can help alleviate Honolulu's transportation and housing crisis. Mixed-use can produce benefits for a community through the creation of spaces that unify community and building.

In this paper I will analyze the ways in which a transit-oriented development (TOD) (a form of mixed-use) reacts to Honolulu's proposed transit system. I explored solutions for downtown Honolulu (urban), M 'ili'ili (neighborhood), and Ewa (suburban) contexts along the transit route. Mixed-use and the transit system will have a large impact on the community and the future of O'ahu.

Chapter 1 – What is Mixed-use?

The current world population is just over six and half billion. Approximately half of the world population lives in cities, which is growing at a rate of 250,000 people per day or roughly the equivalent of a new London every month.¹ While cities around the world continue to grow so do the problems of pollution and congestion. It is expected that there will be a massive urbanization of nearly two billion people, which will demand additional resources and create more pollution and congestion. By the year 2042 the world population is expected to reach nine billion.² Will we be able to support the growing influx of people in our cities, given the current environment in which we live? Do we have the infrastructure and resources to support a growing world population?



Hawaii is not immune to the global issue of population growth. The State of Hawaii averaged an annual 0.9 percent increase in population between 2000 and 2005.³ In Honolulu we can sustain a growing population through the creation of mixed-use areas and buildings. It is possible to control population growth and congestion through compact high-density mixed-use environments that are planned efficiently.

Mixed-use is a term or building type that is used to describe the integration of more than one use or space within a building(s) on a site. A mixed-use project (MXU) can take on various physical configurations: a single vertical structure (i.e.

¹ Rogers, Richard. *Cities for a Small Planet*. (Boulder: Westview Press, 1997) 4.

² <http://www.census.gov/ipc/www/world.html> (accessed: 11.28.06)

³ <http://starbulletin.com/2008/03/20/news/story04.html> (accessed 3.30.08)

(fig.1 population)

Flatiron Building in New York City); horizontal development; multiple vertical structures (i.e. Rockefeller Center in New York City); or a mixture of horizontal and vertical oriented buildings on the project site. Today, most mixed-use projects include: retail, entertainment, commercial, residential, and or hotel facilities within a concentrated area. *Mixed-use developments: New Ways of Land Use (1976)* explains that the definition of mixed-use development is a “relatively” large-scale real estate project with three or more significant revenue-producing uses (such as retail, office, residential, hotel, and recreation) that are functionally and physically integrated through uninterrupted pedestrian connections. The uses of a MXU “may” imply large-scale project; a reason for a large scaled mixed-use is to allow planning and integration of various uses. In addition, large scale is frequently required to support the costly front-end investments associated with many mixed-use developments.⁴ In some aspects, the definition can be “expanded” to include relatively smaller projects that include mutually supporting functions or uses that enhance or strengthen the community, which may not require a large front-end investment.

A mixed-use project is developed differently depending on its conditions (inherent problems and opportunities of its site, community needs and goals, local real estate market, and financial constraints) of the site.⁵ Victor Gruen (designer for one of America’s first shopping malls) observed that the task of creating such a project is “infinitely more difficult and complex” than for single-purpose projects.

Due to its complexity mixed-use projects require extraordinary planning, management, and capital resources. Mixed-use projects are often large in scale and it is imperative to select the right site for the project. A primary issue in selecting a site is finding a location that can create synergy

⁴ Witherspoon, Robert E., Abbett, Jon P., Gladstone, Robert M. Technical Bulletin 71. *Mixed-Use Developments: New Ways of Land Use*. (Washington D.C.: ULI-the Urban Land Institute, 1976) 6.

⁵ *Mixed-Use Development: New Ways of Land Use*, 1976, 11.

between its uses that will benefit the community. The project site should be suitably sized and configured for a mixed-use project. Small or irregularly shaped properties may be more suitable for single-use than for mixed-use depending on its context.

A well-designed mixed-use project requires management between a talented staff of architects, planners, and contractors. An appropriate urban design solution is needed in order to integrate project and surroundings. Mixed-use projects that are planned on more than one parcel rely on a well-designed pedestrian system that connects users from one building to another.

Time is of essence when dealing with any project; and it may be more critical for mixed-use projects. Large mixed-use projects take time for market analysis, predevelopment planning, and construction, which can cost millions of dollars before a project breaks ground. Time means money; and if the timing of a project is not well managed, it can result in large deficits for investors.⁶ An unexpected real estate market crash could jeopardize residential units in a mixed-use project resulting in difficulties with selling units at a profitable price.

Phasing is also critical when planning a large mixed-use project. Phasing allows developers to build a large project in segments that can permit one phase to “open” and earn profit while other sections of the project are in planning or held off until a better time. Developers can take the profits earned and invest in the upcoming phases or for marketing the project. The first phase of a mixed-use project creates the “image” for the development and should be planned to survive on its own in the case that the upcoming phases are not realized. Capital for a MXU must be carefully managed throughout the development of a mixed-use.

Mixed-use projects usually require a sizable front-end investment, which provides for initial construction costs and sales. According to *Mixed-Use Developments: New Ways of Land Use*, it is essential that the “scale, mix, and integration of project components will produce a result more

⁶ Schwanke, Dean. *Mixed-use Development Handbook. Second Edition*. (Washington D.C.: ULI-The Urban Land Institute, 2003) 92.

economically successful than if each element had been programmed and built separately.”⁷ Large mixed-use projects also have the potential to increase the property tax while increasing the taxable value of adjacent properties.⁸

A mixed-use project cannot be assumed to create a better environment and financial return for investors. Like any other project, a mixed-use project can fail, but usually at a higher cost than single-use projects. There is a greater risk involved when doing a mixed-use project, but also a larger reward. The “mixed-use concept can magnify both success and failure in a development venture, and it should be approached with the understanding that such magnification increases both the risks and potential rewards for both the private and public sectors.”⁹ There are many factors that influence the outcome of a mixed-use project such as: site conditions, financial constraints, timing, economic and market conditions (local and global), zoning and regulations, and community input. Victor Gruen advised that, “It would be foolish to underestimate the complexity of such a task (creating a mixed-use project), but on the other hand, shortsighted not to recognize the new opportunities which it presents.”¹⁰

Chapter 2 – History of Mixed-use

The concept of mixed-use has a rich history that can be traced to the ancient Greek agora, the medieval market square, and the 19th century European city. The idea of mixed-use runs far back in history to the earliest civilizations of mankind. Mixing various complementary uses was a logical, efficient, and sensible approach. Many ancient towns and cities celebrated the combination of density and mixed-use.

⁷ *Mixed-Use Development: New Ways of Land Use*, 1976, 12.

⁸ Schwanke, 2003, 139.

⁹ Schwanke, 2003, 29.

¹⁰ *Mixed-Use Development: New Ways of Land Use*, 1976, 11.

The great cities around the world that we have grown to love were influenced by innovation of the Mesopotamian city. During the Early Dynastic Period (3000 – 2350 B.C.E), there were between 10,000 and 50,000 people living in Sumer¹¹ (lower Mesopotamia) and in the area north of Babylonia.¹² Most ancient cities were enclosed with a wall. Outside the wall boundaries were suburban villages and hamlets. Three-meter wide streets were mostly for pedestrians; houses for the rich would line these streets that would lead to the major public buildings. Poorer homes were found on narrow alleys and lanes.¹³ Majority of the buildings in the city were for commercial or industrial purposes, but throughout the city there were homes that would incorporate small shops. "At Tell Asmar, a large building once thought to be a palace has recently been reinterpreted as an industrial complex housing a number of concerns, such as a tannery, a small-scale ironworks, and, at a later date, textile weaving exclusively."¹⁴

The Temple Oval at Khafaje (2650 – 2350 B.C.E.) was an early example of a mixed-use building during the Early Dynastic Period. All existing houses on the site were demolished to clear way for the urban temple (fig.1). The temple may have served as an urban center for the city. A high wall with a single gate, which led into the interior, surrounded this massive structure. Once inside there was a public courtyard, which included a well and circular basins for ablutions and offices for the temple administrators.¹⁵ Within the second wall, there were workshops, bakeries, and storage rooms that surrounded the raised temple.

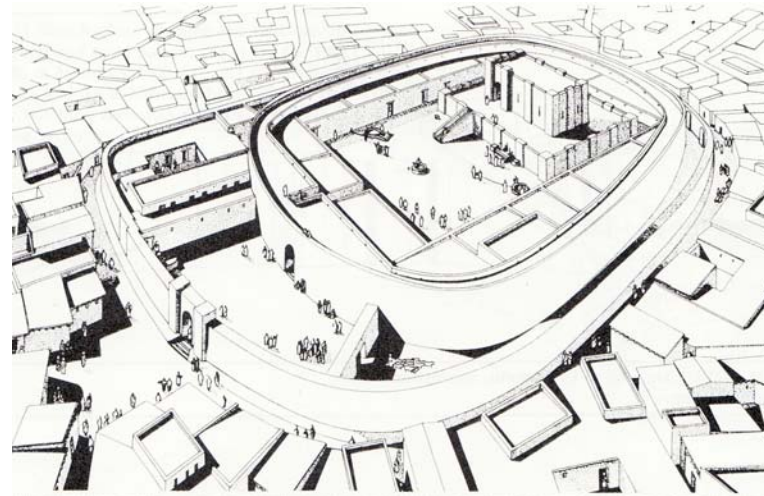
¹¹ A region in present-day Iraq located in the southern part of Mesopotamia.

¹² Kostof, Spiro. *The Rise of the City: Architecture in Western Asia. A History of Architecture: Settings and Rituals* (Oxford: Oxford University Press, 1995), 51.

¹³ Kostof, 1995, 52.

¹⁴ Kostof, 1995, 52.

¹⁵ Kostof, 1995, 52.



8 Khafaje, Oval Temple, ca. 2650–2350 B.C.;
reconstruction view.

(fig.2, Khafaje Temple)

The ancient palaces of China are another example of mixed-use. These “mixed-use palaces” or “palace cities” often served as home for the emperor, government functions and residences for the emperor’s court. As centuries passed, the economy flourished and emperors wanted grander palaces to carry out their wishes. Defense was important for these cities and security for the emperor was a primary concern. Perimeter walls would enclose the palace with watchtowers. During the Northern Wei Dynasty (386 – 534 C.E.), the emperor built the palace city of Wei-Jin Luoyang (fig.2). This palace-city included many halls where various activities for the emperor were held. The Tanji Hall (A) was the main hall where grand public ceremonies were held. The East and West Hall (B) was where the emperor lived and handled the daily affairs of the court. Zhaoyang Hall (C) was the residences for the empress and the imperial concubines. Lingyun Terrace (D) was an arsenal that held supplies for troops. Beyond the various halls was Hualin Garden; here residents could relax in pavilions and kiosks or enjoy the scenic man-made hills and lakes. The palace city plan lasted throughout the centuries in China and played a major influence upon Japanese architecture.¹⁶

¹⁶ Xinian, Fu. *Chapter 3: The Three Kingdoms, Western and Eastern Jin, and Northern and Southern Dynasties. Chinese Architecture* (Connecticut: Yale University and New World Press, 2002), 70.

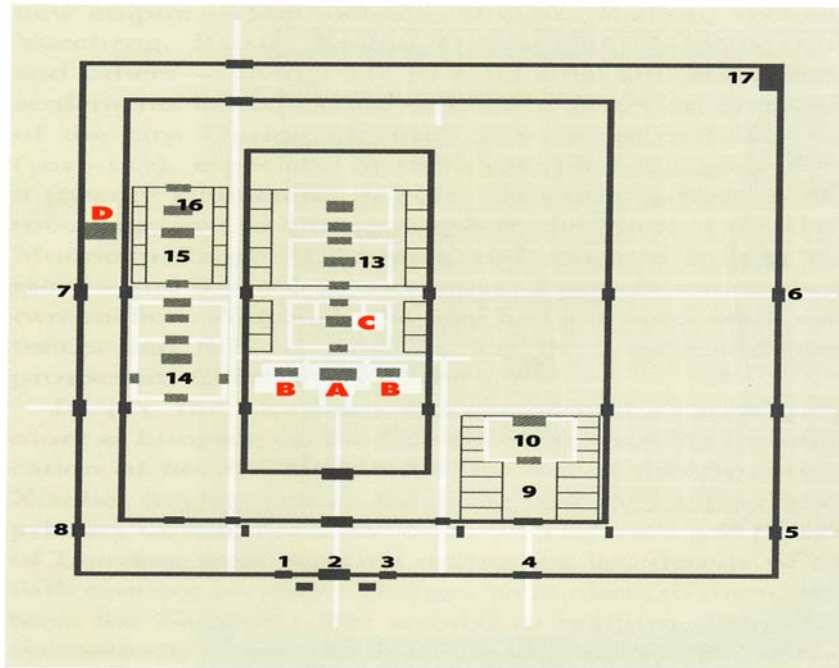


Figure 3.5. Plan of the palace city of Wei-Jin Luoyang

- | | |
|--------------------------------|-----------------------------------|
| 1. Lateral Gate | 12. Morning Sunlight Hall |
| 2. Heavenly Purple Palace Gate | 13. Shiqian Hall |
| 3. Lateral Gate | 14. Establishing Beginning Hall |
| 4. Commander-in-Chief Gate | 15. Nine Dragons Hall |
| 5. Eastern Lateral Gate | 16. Good Fortunes Hall |
| 6. Cloud Dragon Gate | 17. Listening to Grievances |
| 7. Spiritual Tiger Gate | Lodge |
| 8. Western Lateral Gate | 18. East Hall |
| 9. Grand Secretariat | 19. West Hall |
| 10. Hall of State | 20. Soaring to the Clouds Terrace |
| 11. Great Ultimate Hall | |

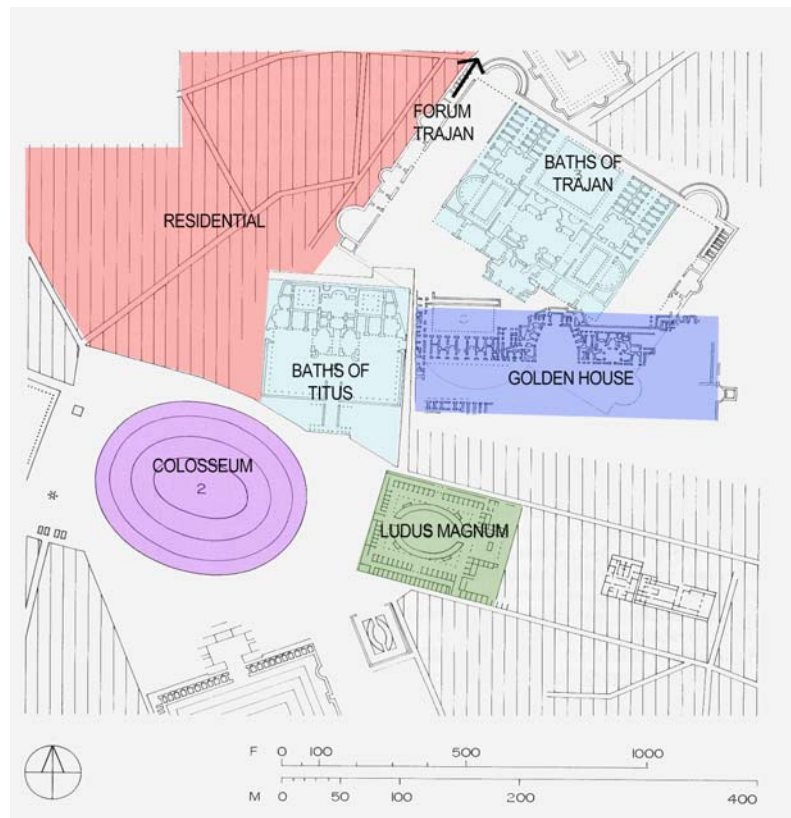
(fig.3, Wei-Jin Luoyang)

Like Mesopotamia and China, Rome has influenced today's built environment. The Roman Empire conquered territories spanning from southern Europe to Western Asia; roughly 2.3 million square miles. Rome enjoyed many luxuries that were made possible through the triumphs of the empire. The core of Rome represented a mixture of activities (fig.4).

Within the core of the Roman city we find baths, an arena, exercise quarters, shopping, and residential. The Golden House was a country villa for Emperor Nero (A.D. 54-68). He used the home for entertaining guests and dignitaries. Nero's collection of sculpture was on display, which was beautifully lit through clerestory lighting. It is said that the lavish rooms of the home had

ceilings which moved and “changed patterns like a kaleidoscope or opened to sprinkle guests with blossoms, and its banquet hall was circular and constantly revolved day and night, like the heavens.”¹⁷ The house was created to glorify the power of the Empire and at times intimidate visitors from other countries. At the end of Nero’s rule, the Flavians buried the Golden House under a bath house.

Built during the Flavian dynasty (A.D. 72-80), the famous Colosseum was situated a few hundred feet from the Nero’s Golden House. The arena is a freestanding structure measuring 188 meters long by 156 meters wide (617 by 511 feet).¹⁸ The Colosseum held more than 50,000 visitors that were entertained by fighters who fought till death or submission. Under the arena floor were chambers that housed services for various events, which included machinery, equipment, and beasts.



(fig.4, Core of Rome)

¹⁷ Kostof, 1995, 209.

¹⁸ Kostof, 1995, 207.

In proximity to the Colosseum and Golden House, are the Baths of Trajan and Titus. Each bath had men and women's quarters with separate entrances. The complex contained a *palaestra*¹⁹, where one could exercise and relax. This room contained a swimming pool and rooms where visitors could prepare for exercise and clean themselves of sweat and dirt afterwards. This area was accompanied by dressing rooms for guests to change into fresh attire. There was a procedure in which one would bathe. First, one would start in the *tepidarium*²⁰ room, where the body would warm up and prepare the visitor for the warmer temperatures of the *caldarium*²¹. After the caldarium, the person would enter the *frigidarium*²², a circular room with windows and an oculus that opened to the main space. Finally the visitor would move to a cold bath area, where they would cool off with fresh water entering into a pool.

The Emperor Trajan who ruled after Nerva, built the Markets of Trajan which faced the center of town. The 40,000 square meter facility was built on a hill; in preparation for the large building, thousands of residents on the site were moved. There were three levels of shops. The ground level shops opened up directly to the street; the second level of shops connected to a corridor that looked out to the forum activities. The third level of stores turned toward a street situated on the hill. Directly across the Market of Trajan was another three story marketplace.

Each forum that was built represents a significant military achievement that was celebrated by many Romans. In addition to a place to shop, the forums were used to celebrate military and artisan achievements.

Just across the Colosseum and Baths of Titus is the Ludus Magnus. This structure served as the training grounds for the gladiators who displayed their talents to the public in the Colosseum.

¹⁹ Area for athletic training which includes a large court with colonnades, rooms for massage, baths, and other activities.

²⁰ A room of moderately warm temperature.

²¹ A vapor bath or hot soak in a bath.

²² The cooler area of a Roman bath, which sometimes included a swimming pool.

Mixed-use throughout history represent an efficient use of land and should be used as a precedent to how we develop our built environment. The Temple Oval at Khafaje was a mixed-use building that described how Mesopotamians combined various uses that complemented the temple. Centuries later, the ancient Chinese created mixed-use buildings that served as a fortress for the emperor, a place to conduct legislative matters, and a place to entertain. Lastly, Rome is an example of mixed-use planning that helped bring its people together to celebrate what would be one of the greatest civilizations. The core of Rome (approximately three million square feet in ground area) was essentially a place for shopping, entertainment, leisure activities, and residential living. Each of the historic mixed-use examples influenced many of our great cities today.

Today, examples of mixed-use can be found in our cities, urban neighborhoods, and suburbs. The idea of a compact single development with a variety of mutually supporting activities within the urban context started in the mid-1950's. According to *Mixed-Use Developments: New Ways of Land Use*, present-day examples of mixed-use in the U.S. started after World War II, when many shoppers began to consider shopping centers as a "one-stop" place for their needs. Local zoning codes that once had supported segregated uses were revised to support mixed-use in urban areas. Moreover mixed-use developments were encouraged by capital improvements, tax incentives, and public support.²³

Chapter 3 – Suburban Living

The birth of the suburbs in the United States can be traced back to the years following World War II. The Federal Housing Administration (FHA) and Veterans Administration (VA) loan programs provided mortgages for millions of single family housing. These programs made it possible for many families to move out of the crowded squalid cities. The FHA and VA programs

²³ *Mixed-Use Development: New Ways of Land Use*, 1976, 5.

discouraged the renovation of housing and construction of row houses, mixed-use buildings, and other urban housing types because people found it feasible to live in the suburbs. Moreover the development of a 41,000 mile interstate highway and subsidies for road improvement paved the way for the automobile.²⁴ Automobile prices also dropped making it an “affordable”, popular, and convenient way to travel. Suburban living was further encouraged by the planning profession. Planning and zoning regulations were changed to separate functions into zones. Zoning was seen as a way to combat the dirtiness and health issues of the city. Industrial uses were separated from office and residential sections to keep hazardous facilities away from living and working areas of the city. As a result of the loan programs, interstate highway system, automobile, and changes in zoning regulations, many cities were neglected and fell into despair. The quick solution to the problems of the city was to move out and start fresh in the suburbs.

The suburb is an invention, an abstract system of “carefully” separated pods of single use developments. The suburban condition completely changed our built environment and introduced a different way of living. Shopping malls with large parking lots fronting oversized roads became the place to shop instead of the corner store. Entertainment, work, and living functions are separated by roads and conveniently accessible only by the automobile, making it difficult for pedestrians. Buildings are forced to conform around the road and cater towards the automobile. Dean Schwanke describes the suburb as:

“...the dominant image and reality of housing is the low-rise, single-family residential subdivision. The image and reality of retail space is found in large regional shopping centers or strip retail space along major thoroughfares. And although a dominant image of office space is still the downtown high rise, the

²⁴ Duany, Andres, Plater-Zyberk, Elizabeth, and Jeff Speck. Suburban Nation: The Rise of Sprawl and the Decline of the American Dream. (New York: North Point Press, 2000) 8.

reality is that most office space in the United States – and much of the new space in other cities of the world – is now found in sprawling, low-density suburban office parks, districts, and corridors.”²⁵

The planning of the suburbs is inefficient and wasteful. Generally, suburbs do not include any places where people can walk from home to places where people can get the things they need. If one lives in the suburbs they should have a variety of uses within “walking” distance. A study in the San Francisco Bay Area “showed that person- miles of travel for shopping purposes are 42% higher in areas with poor accessibility to shopping compared to those with good accessibility.”²⁶ If one works miles away from where they live, they should have other options (besides the automobile) for getting to work. There is an estimate of 500 million cars in the world today; which produce two trillion cubic meters of exhaust fumes per year.²⁷ “In the United States, the economic cost of traffic congestion, in terms of squandered energy and lost time, is about \$150 billion per year, equivalent to the gross national product of Denmark.”²⁸ In suburbia there is less interaction among immediate neighbors and the rest of the community than in the urban areas. Many suburbs lack public space for people to gather, in part because they have no town centers or central civic place.²⁹ As a result we have an uncoordinated jumbled cluster of single use zones with little care for pedestrian life and civic identification, connected only by a network of oversized and overtaxed roadways.

Separated single uses are not healthy growth; they are self-destructive, inefficient, and unsustainable. The suburbs are criticized due their general lack of mixed-use, inefficient development, and uninviting pedestrian systems. Suburban developments are linked to health

²⁵ Schwanke, Dean. *Mixed-Use Development Handbook*. Second Edition. (Washington D.C.: ULI-the Urban Land Institute, 2003) 3.

²⁶ Ewing, Reid. *Best Development Practices: Doing the Right Thing and Making Money at the Same Time*. (Chicago: American Planning Association, 1996) 30.

²⁷ Rogers, Richard. *Cities for a Small Planet*. (Boulder: Westview Press, 1997) 35.

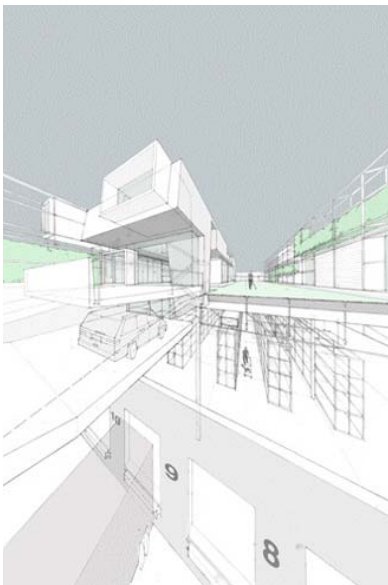
²⁸ Rogers, 1997, 38.

²⁹ Schwanke, 2003, 27.

problems (obesity, respiratory, etc.), traffic accidents, increased commuting time, social isolation, and auto dependency.³⁰

In some respect the suburbs of yesterday are changing by introducing urban characteristics. Santana Row and downtown Walnut Creek in the San Francisco Bay Area introduced an urban setting within a suburban context. Wide landscaped sidewalks encourage pedestrian activity that connects to retail. On the levels above retail, residential and office space are found. Santana Row has the urban feel, but when you exit the project, you are back to suburban life.

There is hope to introduce more mixed-use projects into the suburb. Architecture firm, Lewis Tsurumaki Lewis project "New Suburbanism" explores the possibility of incorporating housing above big box stores. Shopping centers could add residential, hotel, or office components to the existing infrastructure that would probably increase revenue to the project. There is a place for mixed-use whether we live in the downtown or suburbs. Local jurisdictions are favoring mixed-



(fig.5, "New Suburbanism")

use town centers and urban villages within suburban developments.³¹

Mixed-use can provide a center for suburban neighborhoods by creating a place that encourages pedestrian activity. These projects in the suburbs can improve existing main streets into a center for pedestrian traffic with mixed activities with retail and residential spaces nearby.

³⁰ Hirschborn, Joel. *Sprawl Kills: Blandburbs steal your time, health and money*. (London: Sterling & Ross Publishers, Inc., 2005) 8.

³¹ Schwanke, 2003, 27.

Chapter 4 – Opportunities and Advantages of Mixed-use

There are many benefits associated with mixed-use projects. Mixed-use projects are typically large in scale and therefore have a greater impact on their settings than single-use developments. Mixed-use can affect a projects' place making, synergy among its uses, economics, critical mass, operations, and impact on the community.³² The advantages and opportunities for mixed-use projects outweigh their disadvantages. A few advantages are reduction in automobile usage (promoting pedestrian activity), improved social interaction, higher standard of living (access to amenities), economic benefits, and potential for energy savings.

Mixed-use can reduce our dependence on the automobile and other means of traveling by internalizing trips. A mix of uses and pedestrian connections within a development can reduce the length and time spent on trips. This requires that the mixed-use project have complementary uses that will allow users to conveniently walk to their needs.

Much of our built environment is planned around roadways and the automobile. We need to minimize the use of the automobile and provide other means of transportation especially in the United States. Annual automobile costs (sales, insurance, gas, maintenance) can be expensive; these costs can be reduced. People could save the money spent on their automobile and use it towards other more important matters, such as a child's education or a vacation for the family. Taxpayer money could be spent on public spaces and other important matters instead of on our roads.

Automobile use in America is responsible for 20% of our greenhouse gas emissions.³³ The pollution caused by automobiles would also be reduced if amenities could be found within a mixed-use development. Automobile accidents and pedestrian deaths would also be reduced, because

³² Schwanke, 2003, 28.

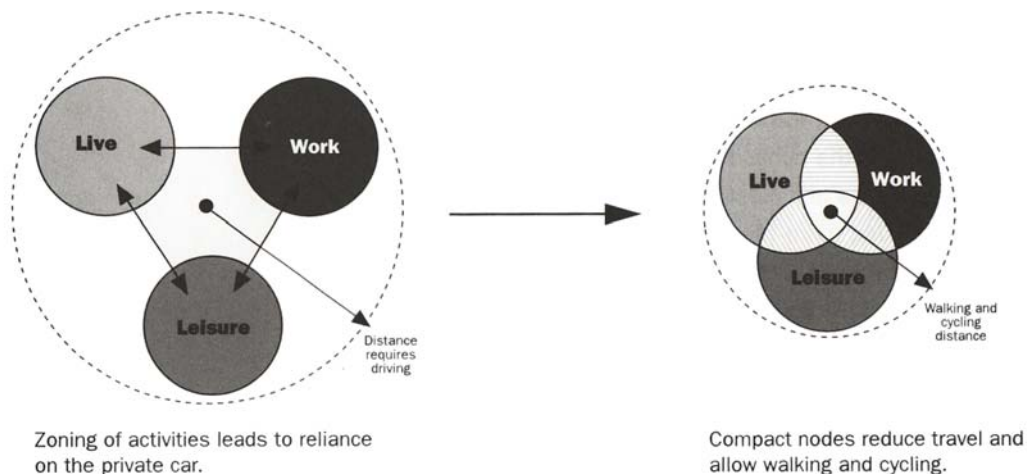
³³ Davis, Stacy C. and Diegel, Susan W. *Transportation Energy Data Book: Edition 26*. (Oak Ridge National Laboratory, Oak Ridge, Tennessee, 2007).

people could opt to walk or use transit instead of drive. There would also be less stress associated with automobile traffic.

A reason for the reduction in pedestrian spaces can be due to the excessive roadways and requirements for such roads. There should be adequate pedestrian space for the elderly, young, and for those who do not drive. Mixed-use spurs pedestrian activity, which provides opportunity for social interaction through public spaces. One is more likely to meet someone while walking to their destination than driving. People would have the option of gathering in public spaces just outside their residence or workplace, instead of driving a car to meet a friend.

Mixed-use can provide a higher standard of living. These projects can become the residential, commercial, and recreational focal points for a community. Living within a mixed-use development where one can walk conveniently to work, school, shopping, gym or the doctors' would save time and money spent on driving and parking. We spend valuable time by driving to each destination, if those needs were conveniently accessible it would make life easier.

Compact mixed-use nodes reduce journey requirements and create lively sustainable neighbourhoods



(fig.6, Live, Work, Leisure diagram)

Mixed-use projects can cost millions of dollars more than other building types due to the complexities of the project. Mixed-use projects can also have economic benefits for private and public entities. MXU's may have shared infrastructure such as parking, where residents and office workers share a parking garage. This can save costs for developers, but other expenses can arise such as the need to pay for additional pedestrian walkways and bridges that may connect the office component to the parking garage. Developers can also save money in common area maintenance (courtyards and social areas), central HVAC, marketing, and other parking operations (valet parking). Due to the mix of uses within the project, operations (management and security) can be more efficient than other building types. Creating synergy between various uses is critical and may bring higher revenues for owners than other building types. This synergy is the result of careful planning, design, and management that creates a positive ambiance for users. Synergy between uses can also improve marketing for office, retail, and residential tenants. Mixed-use projects can achieve greater long-term appreciation in land and property values. Residential components of a mixed-use project can increase in value with civic and commercial uses nearby.³⁴

Mixed-use projects combined with energy conservation practices could provide additional benefits for residents and the environment. A hearing held on energy consumption in the United States stated, "According to the Department of Energy, buildings and their construction are responsible for nearly half of all greenhouse gas emissions in the U.S. every year. The building sector accounts for 39 percent of U.S. total energy consumption, more than either the transportation or industrial sectors."³⁵ Buildings in the U.S. consume 71 percent of the electricity production and while accounting for 9.8 percent of the carbon dioxide emissions worldwide.

³⁴ Ewing, 1996, 21.

³⁵ Statement by R.K. Steward. *Energy Efficiency of Buildings – Hearing before the subcommittee on energy of the committee on energy and natural resources United States senate*. (Washington: U.S. Government Printing Office, February 12, 2007) 12.

Environmental conscious strategies are found in other building types, such as commercial, residential, and educational projects. These strategies could be adapted with mixed-use projects. Photovoltaic panels on the roofs and windows incorporated into a mixed-use project could provide positive results for its users and the environment. Rooftops could be designed with wind turbines that could harness the wind energy and convert it into energy for buildings. This would produce savings on electricity that would typically be provided by power plants. Eco-intelligent design partnership of William McDonough and Michael Braungart helped design a roof garden on Chicago's City hall with the help of Chicago's Mayor, Richard Daley. The roof keeps interior temperatures cool during the summer months and warm during the winter. The roof also provides employees with food and flowers while providing a retreat from the busy city. Roof gardens and farms could be incorporated into the design of mixed-use developments, providing food for residents and employees. Importing costs for food could be reduced. Staple crops could be grown within towers located adjacent to residential and office uses. Wheat, rice, sugar beets and leafy greens could be grown in "vertical farms". An 18-story farm would be able to feed 50,000 people and could fit comfortably within a New York City block.³⁶ Farmers could experience a high demand for crops to feed an estimated three billion-population increase by the year 2050.

Mixed-use projects can create a better place for people to live while offering convenient access to a variety of amenities. Through the creation of mixed-use developments we can reduce our automobile dependence, improve social interaction, property values, and our standard of living. Mixed-use along with an efficient public transportation system can transform our built environment into a place where people can live an efficient, vibrant and healthy lifestyle.

In the following chapter, I would like to review significant and influential mixed-use projects ranging in size, scale, and scope that have changed their surroundings.

³⁶ <http://www.verticalfarm.com/>

Chapter 5 – Mixed-use Case Studies

Flatiron Building (1902)

The Flatiron Building was built in Manhattan, New York, twelve years after the Chicago Auditorium. Designed by Daniel Burnham and John Wellborn Root, the Flatiron stands at 21 stories and just over 300 feet tall; at the time of completion, it was the tallest building outside the downtown business district.³⁷ The site is at 23rd Street, at the corner of Fifth Avenue and Broadway, which allows the Flatiron to be seen head-on from a distance, which is a rare situation in New York City because of the density and closeness of buildings. The Flatiron is conveniently located near subway stations and across the Madison Square.



(fig. 7, view from Madison Square)



(fig. 8, view of surroundings)

The Flatiron is extruded straight out of the site (fig.7, 8). The convergence of Broadway and Fifth Avenue makes the Flatiron appear to be sailing northward, drawing the attention of artists and photographers. The steel-framed building (one of the first ever) is done in the Beaux-arts style

³⁷ Schaffer, Kristen. *Daniel H. Burnham: Visionary Architect and Planner*. (New York: Rizzoli, 2003) 122.

and clad in grayish limestone, brick and terracotta, which separates it into three horizontal sections. The building combines the uses of retail on the ground level and offices up above.³⁸

The building was named "Flatiron" because of the iron-like shape to it. When the building was completed in 1902, it was officially named the Fuller Building, after building promoter, George Fuller. Currently the Flatiron is home for several publishing companies.³⁹

Rockefeller Center (1932-1940)

The original gridiron pattern of New York City had been based on the multiple residential size plots that make up each block; streets were planned to favor cross-town traffic from the Hudson River to East River. Raymond Hood, architect of the Rockefeller Center and his firm tried to persuade the city to vary the street pattern where there would be bridge streets that connect buildings. The proposal ultimately failed. The three block development of Rockefeller Center as "one unified scheme did awaken the city officials to the importance of permitting variances of the rigid street patterns for the future."⁴⁰

³⁸ Schaffer, 2003, 122.

³⁹ http://en.wikipedia.org/wiki/Flatiron_Building (accessed: Nov.4.2006)

⁴⁰ Kilham, Walter H. *Raymond Hood, Architect: Form through Function in the American Skyscraper*. (New York: Architectural Book Publishing Co., 1973) 165.



(fig.9 Rockefeller Center)

Rockefeller Center is located in midtown Manhattan, New York City (fig.9). The Rockefeller Center is an urban renewal project.⁴¹ It had replaced a run down neighborhood with something viable, carrying that part of the city along through a period of new growth and prosperity. The first schemes for the Rockefeller Center were drafted in 1928, but coordination and work on the complex continued into the 1930's.⁴² Rockefeller Center consists of a series of tall office buildings connected by an underground concourse integrated with the city's mass transit system.⁴³ At the concourse level below the streets, there is a variety of shops and restaurants. Shops include: Barnes and Noble, Body Shop, Coach, Federal Express, Kenneth Cole, Movado, Nine West, and Starbucks. The concourse also extends across the Avenue of Americas to include the buildings on the west side of the avenue and two buildings to the north.⁴⁴ The centerpiece of the complex is the RCA building which rises over a pedestrian plaza where at the center there is a Paul Manship's statue of Prometheus and an ice skating rink. During the winter, this area is a popular spot for skating and conversation (fig.10). The Center also provides open space for people beyond what is

⁴¹ Kilham, 1973, 165.

⁴² Doordan, Dennis P. *Twentieth-Century Architecture*. (New Jersey: Prentice Hall, 2001) 41.

⁴³ Doordan, 2001, 41.

⁴⁴ Kilham, 1973, 165.

provided by the streets and sidewalks. Below the center, there is a six story garage built in the Center with a capacity of 800 cars at the lower part of the Eastern Airlines Building.⁴⁵



(fig.10, Skating Rink)

Currently there are tours where visitors can learn more about Rockefeller Center. Tours include: the NBC Studio, Radio City Music Hall, and 'The Top of the Rock.' The top of the rock allows visitors to view the top of the Rockefeller Center from an observation deck.

In Kilham's *Raymond Hood, Architect: Form through Function in the American Skyscraper*, there are interesting comments about Rockefeller Center from architecture critics, Lewis Mumford, Frederick Lewis Allen (American historian), and architect I.M. Pei.

*"What makes the Center architecturally the most exciting mass of buildings in the city is the nearby view of the play of mass against mass, of low structures against high ones, of the blank walls of the theaters against the vast checkerboard slabs of glass in the new garages...Rockefeller Center has turned into an impressive collection of structures."*⁴⁶ – Lewis Mumford.

"There is the use of light and color, and foliage, and fountains, and terraced construction, and clean orderly design to delight the eye..." I recall sitting one afternoon in the restaurant on the British side of

⁴⁵ Kilham, 1973, 167.

⁴⁶ Kilham, 1973, 167.

*the Plaza and looking out on the people strolling by, the bright yellow-green and blue-green umbrellas,...*⁴⁷ – Fredrick Lewis Allen.

I.M. Pei in his 1970's article on "Open Space" says that,

*"The Rockefeller Center Plaza ... is perhaps the most successful open space in the United States, perhaps in the world for that matter." It is a sequence of spaces, starting with the long and narrow "Channel Gardens" from 5th Avenue to the Plaza "...spaces of two different proportions and two different aspects...much more interesting to walk through." "Spaces are for people. And people like to come to Rockefeller Center since this is a successful space. Now perhaps you will find more people in Wall Street per square foot, but I don't think you'll find the variety of people in Wall Street as you'll find right here in Rockefeller Center. People come here as tourists, they come here to shop, they come here to go to the theaters nearby. So we have the variety of activities right here, day as well as night. In their abstract sense, I would consider the Rockefeller Plaza far from ideal in terms of proportion. The spaces are perhaps a little too small for the size of the buildings that surround them. But in a way I'm glad that it isn't larger, because it creates a special kind of intensity here, because of this exaggerated proportion. Just as exaggeration is necessary for effect in theater, so I think Rockefeller Center has succeeded in a way as good theater."*⁴⁸ – I.M. Pei

"The program for the Rockefeller Center is a celebration of commerce and modern technology. It is a model of successful skyscraper urbanism and remains vivid proof that tall buildings can sustain a vibrant urban environment."⁴⁹ The Center combines day and night life, business and pleasure, activities of weekdays and weekends; this is one of the basic reasons why the Center has so much vitality in the New York City landscape.⁵⁰ When I visited the Rockefeller Center in November 2000, it was amazing to see the vast amounts of people gathered near the ice rink. The open space is a characteristic that makes the Center special, people who work in the

⁴⁷ Kilham, 1973, 170.

⁴⁸ Kilham, 1973, 170.

⁴⁹ Doordan, 2001, 42.

⁵⁰ Kilham, 1973, 165.

immediate area spend their lunch breaks in the plaza, enjoying the scenery, socializing and or relaxing.

Unite d'habitation Marseilles (1947-1952)

The Unite was envisioned initially as a prototype for government sponsored housing in postwar France. Le Corbusier received government support for its construction. Le Corbusier provided one of the most important points of reference for the postwar discussion of housing with the design of the Unite d'habitation in France. The project was "experimental and meant that the design was exempt from compliance with existing housing regulations and allowed to exceed standard budgetary guidelines."⁵¹



(fig. 11, Unite d'habitation)

The Unite in Marseilles, the first and most complete of the five Unites d'Habitation built by Le Corbusier, opened on October 14, 1952.⁵² The Unite d'habitation in Marseilles is built on the grass in the middle of an extensive park covering 3.5 hectares (fig.11). The complex faces east-west and

⁵¹ Doordan, 2001, 157.

⁵² Baltanas, Jose. *Walking Through Le Corbusier: A Tour of his Masterworks*. (London: Thames & Hudson, 2005) 113.

has no openings towards the north and the side exposed to the mistral.⁵³ The building measures 165 meters in length, 24 meters in depth, and 56 meters in height (541 ft x 78 ft x 184 ft). The Unite made use of the modular system, which was used for everything, from the dimensions of the perimeter of the block, down to the smallest interior elements. Le Corbusier wanted to find a harmony between the intrinsic human principles of the individual and the collective living. In his book, La Charte d'Athenes, Le Corbusier formulated principles that he would put into practice in Marseilles, which included reserving the ground space of high buildings for green areas, proximity from home and workplace.⁵⁴



(fig.12, ground level)

The Unite complex is distinguished by three horizontal planes of communication: the ground floor, articulated by the pilotis; the intermediate level, which serves as a 'street' with service facilities, and, on top, the shared terrace, which contains the rest of the communal services, all linked by the cluster of lifts. The ground level is open because the building is lifted on pilotis. Pedestrians and bicycles are free to roam this area. There is also a car park. The pilotis are made of concrete and their form is a response to their function: stability for the building and conduits for

⁵³ A strong, cold northwesterly wind that blows through the Rhone Valley and southern France into the Mediterranean during the winter.

⁵⁴ Baltanas, 2005, 114.

the plumbing.” Le Corbusier had placed all the power supply equipment together in the pilotis of the building. The artificial ground is a thoroughfare that provides access to the Unite’s nervous system and makes it easy to locate machinery, pipes and shafts, so that any breakdown can be dealt with immediately.⁵⁵

Unite Marseilles contains 337 housing units of 23 distinct types, spread over 17 stories. These units all enjoy views of the mountains to the east and the sea to the west (except for the units on the southern façade). Each apartment could be adapted to the specific requirements of their inhabitants. Options included individual apartments for students, homes for families with up to ten members and hotel rooms.⁵⁶ The interiors had large windows and a double-height living room bounded by a terrace. There was an open-plan kitchen and a bedroom on the upper floor. The apartment units are designed to ensure proper cross-ventilation and also placed into the framework in a way that also minimizes the number of corridors needed.⁵⁷ “The brise-soleil wall also continues the pattern of the glass curtain wall to the rear of the homes, where sunlight is prevented from



(fig. 13, shopping street)

entering directly in summer but is allowed to penetrate in winter, with the interior space serving as a filter to the terrace.”⁵⁸ The double height residential units were juxtaposed in section and access was provided by internal corridors on every third floor. The corridors are designed with a symphony of colors that adds excitement to the rough concrete surfaces.

⁵⁵ Baltanas, 2005, 114.

⁵⁶ Baltanas, 2005, 115.

⁵⁷ Doordan, 2001, 157.

⁵⁸ Baltanas, 2005, 115.

On levels seven and eight there are communal services for the inhabitants. It is the 'shopping street' and is distinguished from the outside by the parallel vertical strips running along it. The street is filled with shops, offices and other services which, although failing to satisfy all the expectations of the initial project, do allow the inhabitants to do much of their day-to-day shopping.⁵⁹ A restaurant, tea room, and snack bar are featured on this level.

The rooftop is developed as a sundeck and play area for the residents. At the roof there is a kindergarden, a small swimming pool, gym, running track (300 m), buffet bar and the open air theater. These amenities promote a healthy life under the open skies, free from city traffic and in contact with nature.

"The Unite Marseilles was followed by the Reze-les-Nantes, 1955; Berlin, 1957; Briey-en-Foret, 1961; and Firminy-Vert, 1963-68. The series of Unites was a response to the need for large scale housing systems in France to alleviate the heightened shortage after the destruction of the war.



(fig. 14, rooftop)

The Unite in Marseilles was intended to become a blueprint that could be used in other cities. Its extraordinary dimensions were indicative of the urgent need for public housing.⁶⁰ The social setting provided by the Unite's terrace from the kindergarden to the gymnasium, from the theater to the running track all bring together inhabitants of all age groups. "The aesthetic quality of

⁵⁹ Baltanas, 2005, 115.

⁶⁰ Baltanas, 2005, 113.

the design reveals a different sense of mass, texture, and surface than his international style work of the 1920's and 1930's."⁶¹

Beijing Looped Hybrid (2004-2006)

This 160,000 square meter (1,721,600 square feet) mixed-use or hybrid building is situated adjacent to the old city wall in Beijing. This project mixes retail space, a kindergarten, galleries, theaters, eateries, a hotel and a 1000 car underground parking garage. The project can be described as a "filmic urban space; around, over and through multifaceted spatial layers"⁶² The developer, Modern Group wanted to create an "ultra-modern expression of 21st Century ecological urban living"⁶³, essentially it is a "city within a city" that envisions urban space as the central aim along with a variety of activities and programs that can support the daily lives of 2,500 inhabitants.



(fig. 15., physical model)

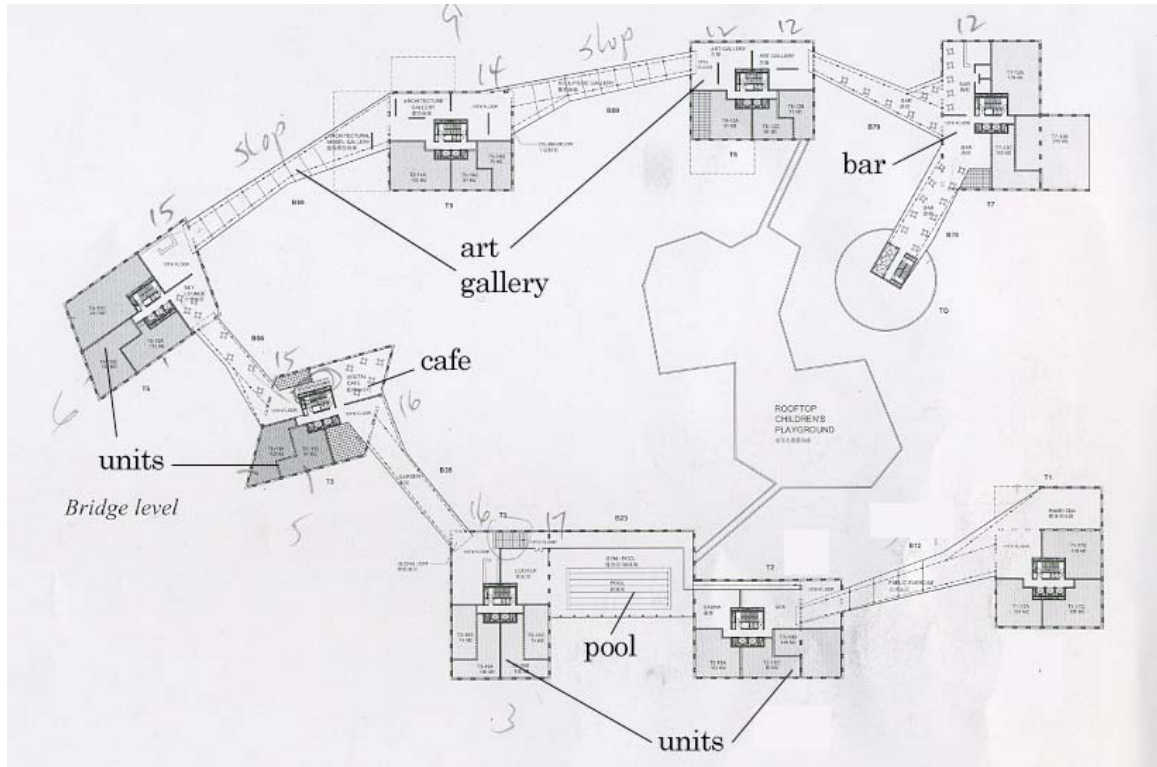
The complex includes eight towers that are connected at the twentieth floor by 'sky bridges' which incorporate a ring of cafes, bars, galleries, spa, a gymnasium pool, and garden

⁶¹ Doordan, 2001, 157.

⁶² Futagawa, Yukio ed. "International 2004: Steven Holl Beijing Looped Hybrid". Global Architecture Document #79, Japan: A.D.A Edita Tokyo Co, 2004, pp.91.

⁶³ Futagawa, 2004, 91.

(fig.15). The passageways which connect each of the eight towers offer panoramic views of Beijing which changes with slight incline or turn of the ramps. Steven Holl has not only created a connection of uses at the ground level but also decided to make a connection high above the ground. These passageways will act as 'interactive bridges' that will encourage socialization among users (fig.16).



(fig. 16, Bridge plan)

There are five landscaped mounds found throughout the site. Each of the mounds is to be created from earth excavated from the site. Mounds include: the mound of childhood, which is connected to the kindergarten; mound of adolescence, where there is a basketball court, rollerblade and skateboard area, and a television and music lounge; mound of middle age, has a coffee and tea house, tai chi platform, and two tennis courts; mound of old age, incorporates chess

tables, reading lounge, tai chi platform, and an exercise machine park; mound of infinity, has a meditation place with the five elements pavilions (water, earth, wood, fire and metal).⁶⁴

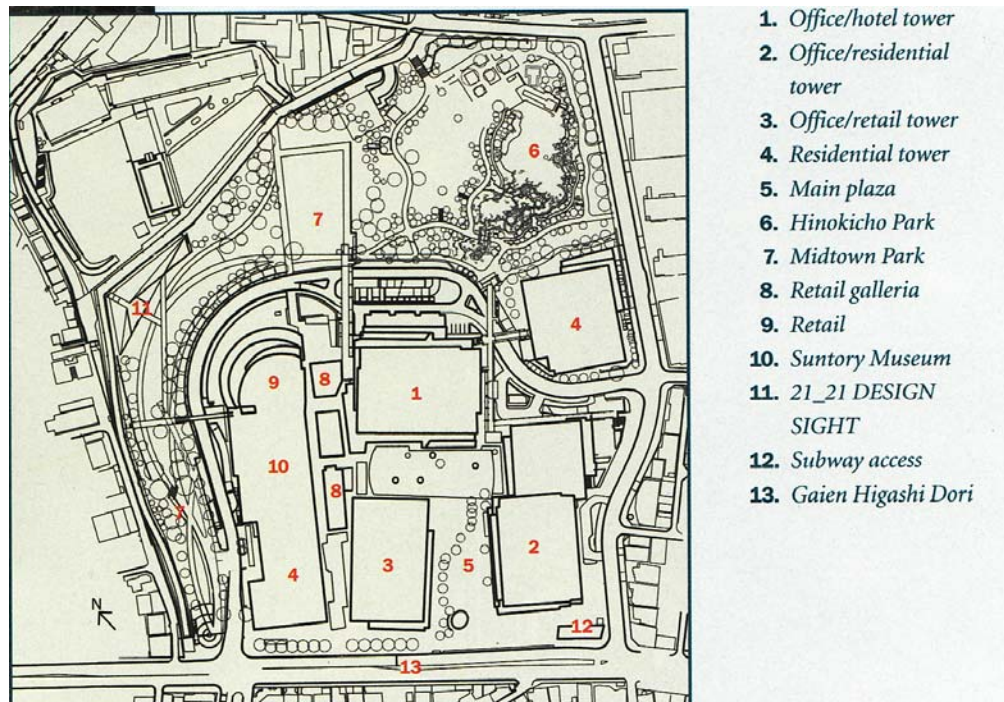
Mass housing in China has been historically standardized and repetitive. The proposed units attempt to break the historical trend by offering residents hundreds of different apartment layouts to choose from. Every apartment has two exposures with no interior hallways. Each of the residential units can be accessed through ground level lobbies. Prefabricated construction of the exterior structure of the eight towers has allowed the interiors for “beamless” ceilings. The Beijing Looped Hybrid is designed with feng shui in mind and when completed the project will achieve a LEED Gold rating.

Tokyo Midtown (2004-2007)

In March of 2007, Tokyo Midtown, a 6.1 million square foot mixed-use development was unveiled in central Tokyo, Japan. The project site takes up 19.4 acres that previously was occupied by the Japan Defense Agency in the Roppongi area of Minato, Tokyo, situated less than a kilometer from the similarly scaled Roppongi Hills Complex. The project began in 2001 when the site was sold at an auction. The Japanese government put the property up for sale in hopes to stimulate their slowing economy. The government hopes to revive the city's core and attract people to live and work in town. Real estate giant Mitsui Fudosan was the primary developer of this project, he chose Skidmore Owings & Merrill (SOM) as lead architect. Local architects Nikken Sekkei developed the master plan for this three billion dollar project that includes residential, restaurant, commercial, hotel, office, outdoor leisure space and the new Suntory Museum of Art. The project's height was limited and buildings could only cast a shadow on neighboring buildings for only a number of hours during the day.

⁶⁴ Futagawa, 2004, 90.

The project's most prominent feature is a 54-story office tower (the tallest building in Tokyo), which is topped by the The Ritz-Carlton. The office space includes several key Japanese businesses as its main tenants such as Fuji and Konami, as well as a medical clinic affiliated with Johns Hopkins Hospital. The luxury 250-room Ritz-Carlton Hotel occupies the 47th through 53rd floors of Midtown Tower, their first hotel in Tokyo, under a long-term lease arrangement. The tower also includes conference halls and meeting rooms near its base.



(fig.17, plan of Tokyo Midtown)

Tokyo Midtown features Tadao Ando's Design Sight 21_21. The building is partially submerged leaving 16 feet of building to rise above grade. The museum is on the edge of the park area and features two buildings; a two story 4,252 SF museum and a single story 2,147 SF building with a café. Entrances to each building face each other with a connected exterior walkway linking the museum to other parts of the development.



(fig.18, Design Sight 21_21 by Tadao Ando)

Suntory Museum designed by Kengo Kuma is a 50,590 SF facility that overlooks the greenery of Midtown. The program includes galleries, museum offices, conference halls, shops and an informal tea-ceremony room that is open to the public.

The majority of the site to the north is reserved for green space; about 40 percent of the overall site is public space. SOM found inspiration in traditional temple gardens to design Midtown's public space. Landscape architecture firm EDAW designed the expansive greenbelt wrapping the site's back (north) side. The landscape provides an oasis from the dense confines of the city. One hundred forty trees were saved from the original site and replanted in the development. On one side is a park filled with flowers, trees and benches. Also in the same space are sculptures, a children's playground, and even a jogging trail. On the other side is a traditional

Japanese style garden in Hinokicho Park, with a lake, exotic plants, winding paths, stone lanterns, and a hut reminiscent of a temple.



(fig.19, Tokyo Midtown in Context)

The case studies review a brief contemporary history of mixed-use starting from the late 19th century. As time past, mixed-use projects have grown in complexity and size, thus having a greater effect on their surroundings. In the following chapter, I will preview the reasons why mixed-use would work in Honolulu.

Chapter 6- Why mixed-use in Honolulu?

Mixed-use is one solution to help sustain O'ahu's growing population. Mixed-use can bring positive economic and social benefits to our communities. It is one solution that can bring people together, while creating lively and efficient environments. Mixed-use developments can be a place to live, work, and play; which are the essential ingredients to a successful community.

There are a number of issues that Honolulu is faced with today such as: homelessness, the need for affordable housing, public safety, curbside recycling, decaying roadways/infrastructure, and traffic/transportation. Through mixed-use developments, we can focus our solutions to traffic/transportation and housing problems.

"In the United States, the economic cost of traffic congestion, in terms of squandered energy and lost time, is about \$150 billion per year, equivalent to the gross national product of Denmark."⁶⁵ A large majority of the population on O'ahu commutes by automobile, causing traffic on most mornings and afternoons. Sitting in your car stuck in traffic wastes valuable time and can cause stress. Those who drive to work during rush hours can spend anywhere from half an hour to a couple hours or more a day in traffic. Honolulu needs to find a solution to its traffic problem.

Honolulu is also currently planning a mass-transit system. The city hopes that the project will provide another means of transportation for residents. The project is designated to serve about 60% of Oahu's population that live within the transit corridor extending from West O'ahu to town.

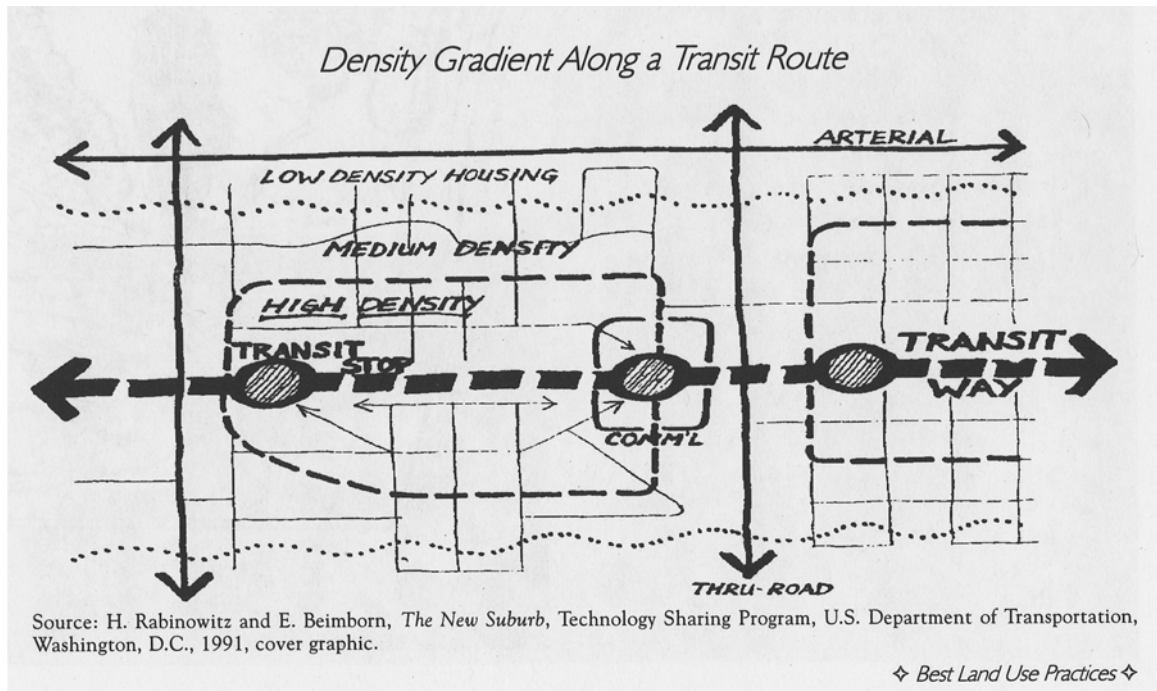
⁶⁵ Rogers, 1997, 38.

The rail line will start in Kapolei and end at Ala Moana Center running a 20-mile distance at an estimated \$4.2 billion; by the time the project is complete costs may approach \$5 billion (fig.20). According to a study report completed by the city, the 20-mile transit system is estimated to increase transit ridership by 21%.⁶⁶ Others oppose the system questioning the need to spend billions of dollars on a system that may have little impact on traffic. Mayor Mufi Hannemann anticipates beginning construction on the transit project in 2009 with completion by 2017. He wants to begin service on the first segment of the transit system in 2012, that runs between east Kapolei and Waipahu. The project is in its infancy and many decisions are yet to be made. It is expected that the area around the proposed transit stations will experience an increase in density, offering retail, commercial, residential, and entertainment uses (fig.21).



(fig.20, Honolulu's transit corridor)

⁶⁶ Borreca, Richard. *Short rail system to cost \$4.2B* (February 8, 2007, Honolulu Advertiser)



(fig.21,Density along the transit)

Honolulu also suffers from a lack of affordable housing. Since 2001, the average price for a median single-family home in Honolulu has increased \$300,000.⁶⁷ In 2005, the average median home was \$590,000; 2006, \$630,000; 2007, \$643,000. Honolulu ranks as the third most expensive urban housing market in six western nations.⁶⁸

The high prices for single family homes make it difficult for Honolulu residents to find a home within their budget. Affordable housing could provide a home for individuals and families with financial hardship. Affordable housing could also improve our homeless problem.

The city is taking steps towards improving our affordable housing situation. The City of Honolulu currently owns about 1,257 affordable rental apartments; while the rest is owned by private developers. The city is looking at building sixty affordable units on a 30,000 square foot property on River Street and Vineyard Boulevard.⁶⁹ Private developers also need to get involved.

⁶⁷ Consillio, Kristen. *Housing Affordability Gap Widens*. (February 23, 2007, Star Bulletin)

⁶⁸ Park, Gene. *Applicants Line up for Affordable Housing* (July 15, 2007, Star Bulletin)

⁶⁹ Au, Laurie. *Recycling, homes are top priorities* (February 22, 2008, Star Bulletin)

Discussions on a 'density bonus', would allow developers to build an additional 10% in units in exchange for adding affordable units to new residential developments.

In addition to the lack of housing, there is also a concern on maintaining the existing projects owned by the city. The 1,257 rental apartments cost the city about \$3.5 million annually. In February 2007, the city was looking to sell 12 properties to private developers to help alleviate the \$3.5 million cost to taxpayers. The available buyers of the 12 properties would be able to improve the units and would have to guarantee that units remain affordable.

There is a compelling need to encourage and preserve affordable housing on O'ahu. Private and public developers will have to cooperate in order to solve the housing issue. Mixed-use could be an avenue for improving O'ahu's housing problem by including affordable housing units in the project.

Along with Honolulu's traffic and housing problems, mixed-use would work in Honolulu due to high property values in many communities. As outlined in *Mixed-Use Developments: New Ways of Land Use*, a steady rise in land costs in a major metropolitan area where intense development is happening can be an incentive for mixed-use.⁷⁰ Developers may see this as an opportunity to invest in compact mixed-use. Private and public groups who decide to develop properties with mixed-use could benefit economically.

Finally, high density mixed-use developments are possible in Honolulu due to the limited land availability. On Oahu, there are few properties available for new projects; agricultural lands in the Ewa side of the island will be developed within the next few decades. Where will we look to develop afterwards? In order to accommodate our growing population, we need to redevelop our existing communities into mixed-use areas. Single uses that currently take up ten city blocks could be compacted to fit within a few blocks. According to the *Honolulu Advertiser*, the City Council of

⁷⁰ *Mixed-Use Development: New Ways of Land Use*, 1976, 39.

Honolulu urged the building department to “allow more flexible height limits in Honolulu’s urban core.”⁷¹ In this article, Councilman Charles Djou said “we face a choice: either we continue to pave over paradise, and build out, or look at going up...” Building dense mixed-use developments within the urban core or proposed transit corridor would sustain Hawaii’s natural landscape. Furthermore, relaxed building restrictions and zoning would make compact mixed-use projects within the urban core feasible for developers and investors.

Mixed-use can improve the housing and transportation problems on Oahu. In order for mixed-use to happen in our communities, it will take the cooperation of both public and private entities, with each willing to sacrifice and compromise for the betterment of Oahu.

Chapter 7 – Project Sites

In this chapter I will examine the three communities along the transit route. Each community exemplifies a different condition: the urban, neighborhood, and suburb. Each community has its own history, needs, challenges, and opportunities.

Ewa

In 1923, the Ewa Plantation Company was the “first sugar company in the world to raise ten tons of sugar per acre...”⁷² Prior to the Ewa Plantation Company, the lands were used for a cattle ranch until 1889. B.F. Dillingham, owner of Oahu Railroad and Land Company negotiated a fifty-year lease with James Campbell (Hawaii business pioneer) to develop the land as agriculture. The land was also sub-leased to W.R. Castle, who decided to build the Ewa Plantation Company.⁷³

⁷¹ Wu, Nina. *Sky's the Limit*. (April 1, 2007, Honolulu Advertiser)

⁷² http://www2hawaii.edu/~speccoll/p_ewa.html. (accessed: September 1, 2007)

⁷³ Ewa Plantation Company. *The Story of the Ewa Plantation Company* (Honolulu: Honolulu Star Bulletin, 1923) 6.

The microclimate of this area was extremely dry with limited rainfall. There was no surface water available for crops, so in order to get water, construction crews had to drill artesian wells.⁷⁴ The Ewa Plantation Company employed 2,200 men to carry out its daily operations in the field and factory. Water was the life source of the plantation. Miles of irrigation ditches were constructed to take the water to the cane fields, which then distributed water to small ditches that fed individual cane lines.⁷⁵ In 1923, 7,587 acres of sugar cane was being irrigated by 68 wells that had a combined daily capacity of 103 million gallons of water.⁷⁶ Six large locomotives and 650 cars were used to transport laborers, tools, fertilizer, materials, and harvested cane. There were 32 miles of permanent track that provided transportation.⁷⁷ "The success of this enterprise can be attributed to a careful and conservative management of the property and the unusual productivity of the land influenced by artificial irrigation and fertilization."⁷⁸

A plantation village supported the Ewa Plantation Company. There were various positions and responsibilities outside of the plantation. Office staff had clerical duties along with interpreting the various languages (Japanese, Filipino, Chinese, Hawaiian, Portuguese, and Spanish) spoken by laborers.⁷⁹ There were also maintenance and sanitary crews who reported all troubles and sicknesses; these individuals also kept the villages clean. A convenience store was on the property that provided a supply of foods for employees. In addition there was a hospital with three wards, a maternity ward, general ward, and private quarters. The hospital came equipped with 36 beds for medical conditions.⁸⁰ Also on property was the Ewa Public School, for the children of plantation employees. There were a total of 22 rooms. On certain days, children would perform work in the

⁷⁴ Ewa Plantation Company, 1923, 6.

⁷⁵ Ewa Plantation Company, 1923, 48.

⁷⁶ Ewa Plantation Company, 1923, 9.

⁷⁷ Ewa Plantation Company, 1923, 74.

⁷⁸ Ewa Plantation Company, 1923, 9.

⁷⁹ Ewa Plantation Company, 1923, 106.

⁸⁰ Ewa Plantation Company, 1923, 111.

agriculture fields.⁸¹ A daycare was also provided to watch over younger children. Tennis courts, swimming pool, and baseball park provided a place for recreation. The baseball park was used by the Hawaiian marching band and plantation baseball league. Football, volleyball, and other sports were also played on the field.

The plantation employees lived in the plantation village. The village consisted of family cottages. The cottages had four or five large rooms and a nice large lawn in front and a vegetable garden in the rear. Each house was equipped with electricity with a storeroom and toilet.⁸²



(fig.22, renovated plantation house)

Ewa Today

It took the strength of a community to support one of Hawaii's successful industries, sugar. The strength of the community continues today with a large residential population. Additional retail and office space will provide opportunities and advantages for the residential population. A mixed-use area or community in the suburbs would reduce the need for residents to commute to Honolulu. The transit system would provide convenient access for those who need to commute from west

⁸¹ Ewa Plantation Company, 1923, 112.

⁸² Ewa Plantation Company, 1923, 121.

Oahu. The Ewa community has been growing; the population has nearly doubled in the past sixteen years and is expected to experience continued growth.

D.R. Horton-Schuler is planning a 1,600 housing and commercial project called Ho'opili, which is located in the Ewa community of O'ahu. The developer envisions building 11,700 homes, five schools, a regional park, retail units and commercial space.⁸³ There are plans for a University of Hawaii West O'ahu Campus, new resorts with waterfront activities. The development will be planned to mimic a small town feeling with a mix of businesses and residential. Instead of focusing on the automobile and road, emphasis will be on the pedestrian, providing a safe place to walk and bike. Retail and commercial spaces would provide employment opportunities for residents.

Downtown

The land that is now called Downtown Honolulu was not always the beautiful city that we have today. In its infancy, the majority of the terrain was flat and barren, there were a few yam patches and mud flats with thatched houses scattered near the shore. The Native Hawaiians relied on crops for food and medicinal purposes and found the flat plains of Honolulu unfit for cultivation. Instead Hawaiians preferred Manoa or Nu'uuanu Valley for living and farming due to its proximity to the streams and fresh water. Honolulu was once known as Kou, which defined the area from Nu'uuanu Avenue to Alakea Street and from Queen to Hotel Street.

In 1793, Captain William Brown of the British trading ship, Butterworth, discovered the only natural harbor in the middle of the Pacific Ocean.⁸⁴ He found that this place could harbor his deep hull ships. Prior to this discovery, western ships had to anchor their ships off shore and take a

⁸³ 'Hoopili project fits goal for growth in West Oahu' Honolulu Star Bulletin Vol. 12, Issue 18 (Jan.18.2007)

⁸⁴ Simpson, MacKinnon. *Century of Aloha: The Creation of Modern Honolulu, 1905-2005*. (Honolulu: Mutual Publishing, LLC, 2005) 3.

rowboat towards land. The name Honolulu meaning “Fair Haven” was given to the newfound harbor that would make this once barren land the capital of the state.

In 1820, Missionaries arrived in the Islands bringing Christianity and cultural values that would drastically change the culture and heritage of the Hawaiian people forever.⁸⁵ Forty years later, the landscape of Honolulu was “a mixture of one-story and two-story buildings of wood, coral block, or adobe surrounded by thatched houses and hybrid buildings combining Hawaiian and western elements...”⁸⁶ During the whaling boom, more than a hundred ships docked in Honolulu and hundreds of sailors flooded the town. As more ships docked in Honolulu, it became the main harbor for sandalwood, sugar, and pineapple commerce.

By 1890, Honolulu was the center of the economic, political, and social life in the Islands. Missionary descendents began to set up small businesses in the once barren plains of Kou. The landscape changed from desolate lands to beautiful greenery filled with flowers, trees, shrubs, and vines imported from other tropical locations.⁸⁷ Honolulu changed forever on January 17, 1893 when the Hawaiian Monarchy was overthrown by planters and businessmen. They formed a secret organization, the Hawaiian League, to take control of Hawaii with the support of American troops docked in Honolulu Harbor. The Hawaiian League marched into Iolani Palace and demanded that Queen Liliuokalani step down from her throne. The Queen decided to hold her throne and protest the revolution instead of retaliate and risk the bloodshed of her people; she only hoped that the United States would hear her appeal and restore the Hawaiian Monarchy. Unfortunately this did not happen and on April 30, 1900, the United States Congress declared Hawaii, a Territory of the United States.

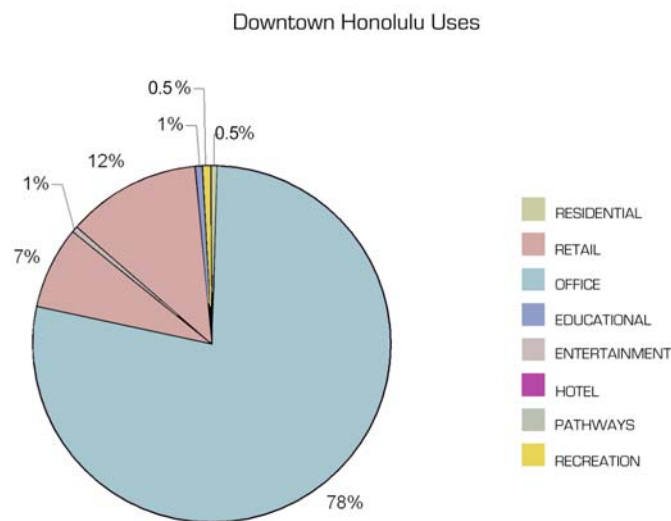
⁸⁵ Ames, Kenneth L. *On Bishop Street: Avenue of Hawai'i Pioneers*. (Honolulu: First Hawaiian Bank, 1996) 6.

⁸⁶ Ames, 1996, 6.

⁸⁷ Ames, 1996, 11.

Downtown Honolulu Today

Today Honolulu is the capital of Hawaii. The area has transformed from one to two story buildings during the 1800's to 40-story commercial buildings. There are perhaps thousands of local and national businesses located in Downtown Honolulu. Like M 'ili'ili, Downtown Honolulu has the "right uses" to support a community.



(fig.23, Downtown Honolulu Uses within 15 minute walk of mixed-use project, note: 12% and 7% apply to retail)

There is a lack of residential and certain retail functions; such as a grocery store within walking distance. There is a Safeway on Vineyard Boulevard, but it is not within a convenient distance from most of downtown. Figure 23 is a chart of the various uses within a fifteen-minute walk of the mixed-use site on Nimitz Highway. If additional residences were provided, more restaurant and retail amenities would need to follow. A twenty-four hour entertainment hub with

restaurants, residences, bars, shopping, and theaters would bring people into the area after working hours and provide additional security for the Chinatown area. The planning of the transit station will be critical in continuing to develop an exciting and thriving downtown.

M 'ili'ili

M 'ili'ili was named after the "sea of small stones, of extraordinary pebbles, of 'ili'ili ..."⁸⁸ M 'ili'ili is home to natural caverns, ponds, and springs that are found in numerous spots throughout the district. The coral limestone under M 'ili'ili is made of beach sediments, cream and white colored water-worn grains of small marine organisms, few shells, and fragments of coral.⁸⁹ The limestone is covered by alluvium, or sediment that was deposited onto the coral by the flowing water from the Ko'olau Mountains (fig.24)

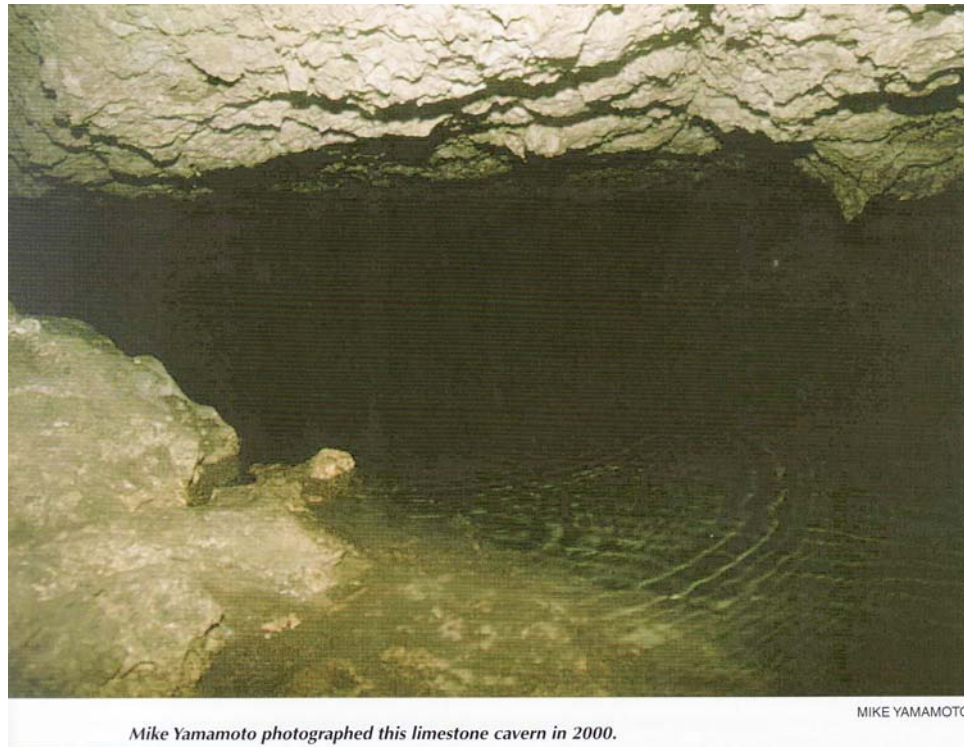
A cave dweller described the caves as:

*"dark with pocket-holes of light...the water was pretty clear and cold...the deepest part was about five feet deep with stepping stones. Lots of small fish kind of glowing... The water was fresh, not brackish, and it was pretty crystal clear. The passageway was five to six feet wide, and sometimes you had to crawl down. There was enough room to stand up..."*⁹⁰

⁸⁸ Ed. Ruby, Laura. *M 'ili'ili -The Life of a Community*. (Honolulu: M 'ili'ili Community Center, 2005) 1.

⁸⁹ Ruby, 2005, 3.

⁹⁰ Ruby, 2005, 8.



Mike Yamamoto photographed this limestone cavern in 2000.

MIKE YAMAMOTO

(fig.24, M 'ili'ili Cavern)

During the early 1930's, a cavern with a width of 20-40 feet and 10 feet deep was revealed near University Avenue and King Street.⁹¹ Following the discovery of other large caverns in the area and various sinkholes that damaged the structural integrity of buildings and streets, residents and contractors decided to fill the caverns to ensure safety.

Farming in M 'ili'ili was plentiful due to the natural streams of Manoa, Palolo, and Ala Nalo that brought fresh water into the taro fields.⁹² The Hawaiian diet relied on poi (Hawaiian mainstay food) produced from taro. When the small pox plague hit in 1853, the Hawaiian population decreased and Asian migration increased; this caused a major change in cultivation from taro to rice fields.

The Quarry in M 'ili'ili was another significant mark in the history of the district. According to the 1900 Census, "eighty-four M 'ili'ili residents held Quarry or Quarry – related jobs. There were

⁹¹ Ruby, 2005, 12.

⁹² Ruby, 2005, 36.

fourteen Japanese M'ili'ili residents listed as skilled stonecutters and fifty-five workers were stonebreakers (fifty-three listed as Japanese, one as Portuguese and one as Hawaiian). Other occupations related to the Quarry included dray drivers and assistants, stable keepers and stone truckers. There were fifteen M'ili'ili residents, six Portuguese and nine Japanese in these positions."⁹³ As the blue basalt lava rock continued to decline in supply, The Quarry came to a close in 1947, shortly after the war. Unfortunately the dust created before the closure, remained in the community. Finally several years later, "the University of Hawaii took possession of the 95 acres of Quarry land. Through the 1960's, the University used the Quarry as a parking lot. During the rainy season, students walked through muddy puddles and up the gray wooden stairway to reach the UH upper campus. During the 1970's, temporary classrooms were constructed and classes, such as photography, were held on the site of the old Quarry."⁹⁴ Today, the grounds of the Quarry is home to the Stan Sheriff Arena, the UH athletic facilities, and a five story parking garage that provides a link between upper and lower campus.

Mō'ili'ili Today

Mō'ili'ili has a rich culture and history that make it unique among the other districts on O'ahu. The Honolulu Stadium on King Street was the venue for a show by Elvis and baseball legend Babe Ruth. Varsity Theater on University Avenue has hosted shows since opening in September 1939.⁹⁵ Following World War II, Mō'ili'ili experienced a rise in Asian and Pacific Islander immigrants. Today many immigrants, descendants of Quarry workers, young families, and university students call Mō'ili'ili home.

⁹³ Ruby, 2005, 74.

⁹⁴ Ruby, 2005, 79.

⁹⁵ Ruby, 2005, 247.

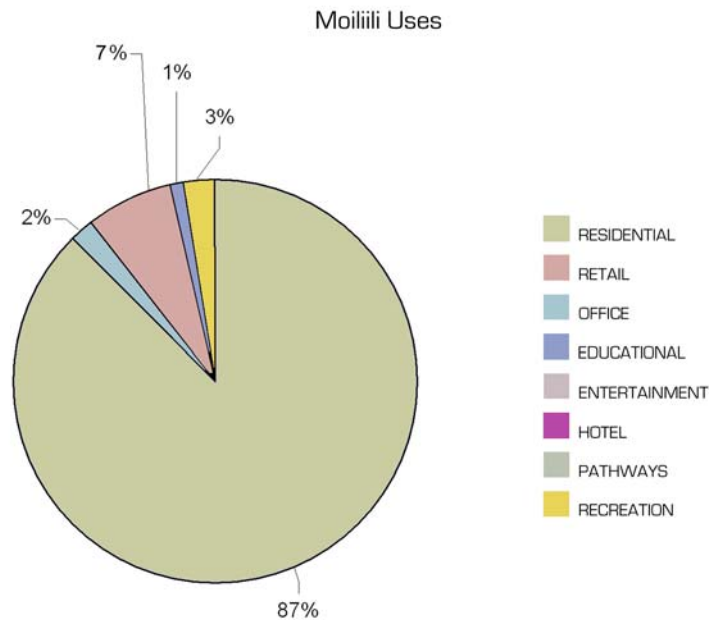
During mid-day, there are many pedestrians in the Puck's Alley area: students on bikes, students walking to and from the university and elderly walking to the nearby grocery store, Star Market. University Avenue, Beretania Street, and King Street have the most vehicular traffic in the area and are the main roads in the district. They are also the major edges dividing the community as it serves as a through way for Waikiki, East Oahu, and University motorists. It takes some time to cross the six lanes of University Avenue and King Street. The majority of the public vehicle parking is located at University and King Street, near the proposed transit station. Single-family housing and two story walk-up apartments dominate the area of study. There are a number of condominiums found south from King Street. The major parks in the area are Old Honolulu Stadium Park and Mō'ili'ili Park.

Businesses in Mō'ili'ili have prospered during the 1970's and 80's. Today businesses are finding themselves in competition with the larger big box stores, which force small business owners to diversify or go out of business. People may decide to shop at Costco's before going to the neighborhood Star Market. Retail and commercial owners agree that there is not enough parking. Many shoppers have to find street parking, which can be inconvenient and as a result businesses suffer.

Mō'ili'ili is in need of redevelopment. A single mixed-use building would do little to change the community; instead establishing a plan for a mixed-use area would benefit and impact residents and visitors on a larger scale. A major challenge is to consolidate the properties owned by individuals. There maybe owners who are willing to sell and others who are not. Major redevelopment is impossible unless a developer is able to consolidate these smaller parcels.

There are many planning issues that may prove difficult to solve without careful design and planning, community support, and adequate funding. M 'ili'ili has the right uses to provide a "live, work, and play" environment, but it is in need of a plan or concept that could enhance the features

of this unique community. Figure 25 represents a composition of the existing land uses within a fifteen-minute walk of University Avenue and South King Street.



(fig.25, M 'ili'ili uses)

A few planning suggestions featured were reviewed in the M 'ili'ili Regional Planning Study, drafted by Cooper, Robertson & Partners along with Group 70 International⁹⁶:

1. Provide better streetscapes through wider sidewalks for pedestrians and space for other modes of transportation (rollerblading, skateboarding, bicycling) and landscaping. Many university students who live in M 'ili'ili commute to school on foot or bicycle.
2. Reduce large roadway widths.
3. Increase pedestrian circulation options.

⁹⁶ Moiliili Regional Planning Study – Draft 8.19.02 produced for Kamehameha Schools by Cooper, Robertson & Partners and Group 70 International.

4. Much of the uses are dispersed throughout the neighborhood without careful thought as to where each would be most efficient. "Mixed-use pods" should be utilized; where retail and commercial functions are found on the ground level with residential and or office spaces above. Corner stores and amenities would provide basic services for residents within closer distances that are "out of reach" from major retail centers. Corner stores suffer in suburbs/low-density areas, but thrive in cities/higher-density areas because of pedestrian traffic. Mixed-use facilities with residential space should be provided along King Street and University Avenue.
5. Provide an appropriate amount of parking. Parking ratios should encourage walking and other means of transportation and not the automobile. Parking should be behind buildings, not in the front. Curb-side parking should be utilized where appropriate.
6. The development is mostly low-rise, two to three story walkup apartments with a few mid-rise apartment buildings and single family homes. In-fill housing may provide an appropriate density for various parcels. Overall density of Mō'ili'ili should be increased.
7. Housing for the aging population. Placing senior housing near commercial centers, transit lines, and community facilities, will provide them with convenient access to public transit.⁹⁷
8. Affordable housing for low-income residents.
9. Attract mid to high-income residents. This should provide a better mix of income levels. Provide a place for mixed-incomes, mixed cultures, and mixed ages.
10. Zoning, building codes, and height restrictions should be changed accordingly to allow denser development and mix of uses. The current parking ratios should also be examined.
11. Provide UH dormitories to strengthen the community relationship with the University of Hawaii (This would increase business from students).

⁹⁷ Ewing, 1996, 21.

12. Provide roof gardens to produce “community foods” for consumption and sale.
13. Provide a farmer’s market in area
14. Provide a “Gateway” for UHM.
15. Redevelop or consolidate walk-up apartments. Many appear to be in poor condition.
16. Provide an entertainment hub in the Puck’s Alley vicinity that is in connection with the proposed transit station.
17. Major redevelopment will not happen unless a developer is able to consolidate the small parcels owned by individual property owners.

Chapter 8 – Design

There are many issues that Honolulu faces today. Two of those issues are transportation/traffic and housing. As Honolulu grows, these issues will become increasingly critical to the lifestyle of every resident. Although the City of Honolulu is taking steps towards improving the infrastructure by approving plans for a mass transit system, there is still much more to be done.

In each mixed-use solution, parking requirements are reduced to encourage other means of transportation, including biking, walking, and transit. Service areas are usually included in most projects, but for the purpose of understanding mixed-use and its major components, it was left out in each scheme. Affordable units are included in the programs of each scheme to support the need for affordable housing in Honolulu and to encourage a mixed-demographic within the projects.

The solutions for mixed-use in each community are presented through diagrams and maps. These solutions take a speculative look at mixed-use and transit and how these two parameters may occur in each community. This study is an analysis of the various components involved in a mixed-use project and how each program responds to the community. Different

structuring or configuration of mixed-use and orientation of the transit system were explored in each project site. The transit route in each scheme may deviate from the actual route that is taken when the transit system is completed.

Ewa

The Ewa project site is different from the other two sites: downtown and Mō'ili'ili, it is a greenfield. The surrounding context was assumed based on a land-use plan completed for Ho'opili. According to the land-use plan the project site is designated for mixed-use with medium density residential. The site covers 27 acres located along Farrington Highway.

This suburban mixed-use displays the transit line at grade traveling through the center of Farrington Highway (see DWG A1). The transit station is located in the middle of parcels A and B, above Farrington Highway. Traffic on Farrington Highway travels under the transit platform. Transit riders stopping at the Ewa mixed-use will exit onto a platform above the highway and be able to access parcels A or B. Transit riders can cross over to the opposite platform through the linear retail mall that follows along the spine of the project.

The transit platform is featured on the “main street” of the project on Farrington Highway (see DWG A3). A line of retail stores is on the main street of the project, which is penetrated by pedestrian openings that flow into parcels A, B, and C. Along with the retail stores at the ground level, there are landscaped areas for relaxing. On parcel A, there is an outdoor theater with seating on hill that gradually descends to a stage. Adjacent to the outdoor theater is an open field. This open field could be used for craft fairs, farmer’s markets, or playfield for children. Parcel B features fountains and a garden. This is the perfect place to take a break from shopping or to meet someone for lunch. In parcel C there is a landscape area made for sitting in the shade and enjoying the surroundings.

The site is well connected to the surrounding parcels and welcomes pedestrians to relax or shop. On parcel A, there are two vertical towers; one is a tower with condominiums and the other is an office tower. Each tower is a 150 feet high or 15 stories tall. Access to the upper levels is possible through the “pathway colored” blocks (see DWG A3). These blocks would include escalators and elevators for convenient access to the linear retail mall or amenities above. Featured in parcels B and C are residential towers with lobbies at the ground level.

A linear retail mall at the upper levels connects the various towers at levels 4, 5, and 6; this gives pedestrians access to upper level amenities. Also on the upper levels are a mixture of condominiums, affordable, and senior living units. At various levels of the project, there are roof gardens (or green roofs) for residents or office employees to enjoy. These areas will reduce heat gain on the projects’ roofs while offering outdoor spaces for people to enjoy (see DWG A1 and A2).

The Ewa mixed-use presents a horizontal solution to mixed-use. This mixed-use project is not only for the residents and employees within the mixed-use but those of nearby properties. The Ewa mixed-use project is intended to bring the community together through its “main street” retail and public amenities (outdoor theater, craft fairs, farmer’s market, fountains, and gardens) appeal. The space allocated for parking is larger in this scheme than the other two concepts. This project could be used as a “park and ride” spot, where people could park their motor vehicles and ride the transit to other locations.

The following calculations were used to determine the number of residential units and parking in the Ewa mixed-use project:

1. Condominiums = (units 800-1200 square feet); average unit size = 1000sf; with 85% building efficiency.
2. Affordable units = (units 600-1000sf); average unit size = 800sf; 85% building efficiency.
3. Senior Living = (units 400-700sf); average unit size = 550sf; 85% building efficiency.

4. Parking is determined at 400sf per stall

Building efficiency can describe the percentage of the total square footage that can be used for residential units. Common areas (lobbies, mail rooms, lounges, corridors, egress, and trash receptacles) make up the remainder of the space in a residential building. I assumed an 85% building efficiency for each residential component.

<u>Ewa Program</u>	Areas (square feet)	% of total of project area
Retail	576,001	15.4%
Office	382,794	10.3%
Residential – 1786 units		
Affordable – 409 units	385,110	
Senior Living – 149 units	96,277	
Condominiums – 1228 units	1,444,161	
Total:	1,925,548	51.6%
Educational		
Daycare	2,500	
Public space		
Outdoor theater	69,481	
Open field	86,414	
Fountains	54,514	
Garden	79,952	
Parcel C landscape	81,024	
Total:	371,385	10.0%
Parking (park and ride) – 1189 stalls	475,778	12.7%
Project Area:	3,734,006	100.0%
Project Site:	1,163,000	(27 acres)

Downtown

In this concept the mixed-use project is featured on four parcels located between Kekaulike Street and Nuuanu Avenue (running west to east) and between South King Street and Nimitz Highway (north to south). Part of the project extends across to Nimitz Highway onto Piers 13 and 14. The total size of the project site covers 10.4 acres of prime real estate in downtown Honolulu. Major uses on the proposed site are Hawaii National Bank, American Savings Bank, a parking lot, and Marin Towers (affordable housing complex).

The transit line at this site runs underground along Nimitz Highway between parcels D and B (see DWG B3). An underground transit platform provides access between each parcel with retail, residential, and parking found on level B1. There are two underground parking garages, one located at Mauna Kea Street and the other on Nimitz Highway. There are 432 parking stalls.

In downtown Honolulu, there is limited use of the waterfront, due to Nimitz Highway. The existing waters near Piers 13 and 14 would be filled to provide additional land to support the MXU. The mixed-use complex is setback from Nimitz Highway to provide an area for public activities and retail. Across Nimitz Highway on parcel D is a line of shops with residential and office spaces. The building on this parcel provides public space near the waterfront and the area adjacent to Nimitz Highway.

Improving the existing pedestrian connections into the project was also important in the design. There is a strong existing pedestrian mall on Kekaulike Street that houses numerous restaurants and small shops; during most mornings and afternoons this is a popular place for dining and shopping. The project connects into this pedestrian mall (where the mixed-use project meets Oahu Marketplace) at the corner of Kekaulike and King Street, bringing people into the heart of the project. This mall flows through the central area connecting into the major business section via Merchant Street. Retail and restaurant uses along with museum space and cinema theater are

found in this area along with office space above. The project also connects into Chinatown through Smith and Mauna Kea Streets. Mauna Kea Street receives pedestrian and vehicular traffic that unites with Nimitz Highway.

The public space continues on through the upper floors of the development. On level 3 a 'pedestrian pathway' connects each major section of the project. A daycare is also located along this pathway. Retail space connects through three legs that bridge Nimitz Highway onto parcel D.

The tower on parcel A reaches 40 stories, parcel B is 32 stories high, and parcel C is 45. On the upper levels of each tower there are condominiums, affordable units, student housing, a day school, playground, hotel, retail, and a museum. A park is found on level 12 offering users a place for recreation while enjoying the views of downtown Honolulu. Public space continues with retail and museum spaces on level 30. The museum space also provides scenic views of the city and waterfront.

An objective of this urban mixed-use was to provide residential space for a community that contains a large business population. Providing different types of housing would introduce various social classes into the area, therefore producing a mixed-income mixed-demographic project. Hawaii Pacific University (HPU) student housing units were included to fuel this mix and reduce the need for housing on the Windward campus. There has also been an increase in student enrollment at the University; these additional units would help satisfy that need. The school anticipates a 2% total increase in students by 2009.⁹⁸ Many HPU students room with three or four roommates to high-priced downtown condominiums to save costs on living.

The following calculations were used to determine the number of residential units and parking in the downtown Honolulu mixed-use project:

⁹⁸ <http://www.hpu.edu/index.cfm?contentID=8051> (accessed Jan.31.2008)

1. Condominiums = (units 1000-1800 square feet); average unit size = 1400sf; with 85% building efficiency.
2. Affordable units = (units 600-1000 square feet); average unit size = 800sf; 85% building efficiency.
3. Student housing = (units 300-600sf); average unit size = 450sf; 85% building efficiency.
4. Parking is determined at 400sf per stall

<u>Downtown Program</u>	Areas (square feet)	% of total project area
Retail/Restaurant	315,904	11.3%
Office	314,103	11.3%
Residential – 1234 units		
Affordable – 372 units	350,256	
Student housing – 216 units	203,660	
Condominiums – 646 units	1,064,282	
Total:	1,618,198	58.1%
Hotel	124,410	4.4%
Educational		
Day school	56,550	
Play areas/ park	40,852	
Daycare	3,120	
Total:	100,522	3.6%
Entertainment		
Gallery	42,049	
Cinema Theater	60,895	
Museum/scenic point	36,224	
Total:	139,168	5.0%
Parking – 432 stalls	172,887	6.2%

Project Area:	2,785,192	100.0%
Project Site:	451,980	(10.4 acres)

M 'ili'i

In this design, the development occurs on the corner of University Avenue and South King Street. The mixed-use project site extends over H1 Freeway and into the two parcels on Kalo Place and Varsity Circle. This area is found south of the University of Hawaii's Athletic Complex and Stan Sheriff Center (see DWG C1). Aged apartment buildings and single-family homes occupy parcels A and B. It would be a challenge to acquire these parcels because of the multiple landowners.

The transit line in this scheme is elevated. The rail travels along South King Street and enters the project site on the corner of University Avenue and South King Street. The rail runs between an office and museum spaces and directly into the center of parcel C. The transit car stops at a landscaped platform connected to retail and restaurant uses. In this scenario the site is planned as a terminus point for the transit before proceeding to Waikiki, which is different from the current proposal for the transit system. The current proposal has the transit route traveling over H1 Freeway and stopping at the university.

The mixed-use project is well connected within and outside project boundaries. Pedestrians are able to enter the mixed-use project along two major malls leading from University Avenue into the 'project artery' that connects into Kahuna Lane (see DWG C1). Pedestrian activity along South King Street is accessible into the mixed-use through the project artery. This main avenue leads directly into parcels A, B and into the lower campus of the University of Hawaii. Retail and restaurant uses are found along the main avenue. In order to provide a welcoming gateway

into the university, shops are found in the underpass of the H1 Freeway. The underpass of H1 would be widened accommodate space for the retail functions.

The project is also connected through the transit platform. Riders are able to walk to all the other parcels of the project. A retail pathway through one of two towers connects over H1 Freeway. The retail pathway that connects parcels C and A leads into the pedestrian mall of the Stan Sheriff Center (see DWG C4). This connection would provide a convenient access for sporting fans that attend the games at Stan Sheriff Center.

The majority of the entertainment uses are located near the transit line in order to take advantage of the anticipated high volume of pedestrian activity in this area. Condominiums, student dormitories and senior living units are found near the transit stop. The linear volume of the student dormitory is positioned above the transit line in parcel C. There are also garden spaces that protrude from this volume.

Office use is positioned above the retail space fronting South King Street. A student gallery space is above this office space. This gallery will provide space for student artwork and performance space for a small audience. This will give university students an opportunity to display their talents to the public. Additional university classrooms are featured adjacent to the Sheriff Center (parcel A) to provide for additional school programs and expand on their existing programs. A large playing field is located in parcel B (found in DWG C1 and C2). This field could be used for recreation and sporting events and practices.

In this neighborhood mixed-use, creating a center for the community and University of Hawaii students is of utmost importance. The University of Hawaii and the community are disconnected because of the H1 Freeway; these two should be connected. There is no indication of the university's presence in the community. Improving this connection between the University and M 'ili'ili is critical in bringing the community together with the school.

Providing retail uses to support the high volume of residents is important for the mixed-use project and M 'ili'ili. Food marts, cinema theaters, museums, clothing stores, cafes, restaurants, clubs, and bars are featured in the project. Creating a 24-hour place for students and M 'ili'ili residents would bring additional revenue for the project and community.

Senior living units are included in the program to provide housing for the large population of old and retired who live in the community. Senior living, affordable units, and student dormitories would offer a diversified demographic to the project and community.

It is unfortunate that the City of Honolulu is not choosing to build a transit station near the University of Hawaii during the first phase of the transit system.

The following calculations were used to determine the number of residential units and parking in the M 'ili'ili mixed-use project:

1. Condominiums = (units 800-1200 square feet); average unit size = 1000sf; 85% building efficiency.
2. Affordable units = (units 600-1000 square feet); average unit size = 800sf; 85% building efficiency.
3. Student housing = (units 300-600sf); average unit size = 450sf; 85% building efficiency.
4. Faculty housing = (units 300-600sf); average unit size = 450sf; 85% building efficiency.
5. Senior Living = (units 400-700sf); average unit size = 550sf; 85% building efficiency.
6. Parking is determined at 400sf per stall.

<u>M 'ili'ili Program</u>	Areas (square feet)	% of total project area
Retail/Restaurant	534,278	16.7%
Office	487,971	15.2%
Residential – 1,954 units		
Affordable – 372 units	437,056	
Senior Living – 174 units	112,896	
Student housing – 745 units	394,448	
Faculty housing – 183 units	96,736	
Condominiums – 480 units	564,184	
Total:	1,605,320	50.1%
Educational		
Classrooms	165,000	
Day-care	6,000	
Total:	171,000	5.3%
Entertainment		
Student Gallery	17,360	
Museum	29,344	
Cinema Theater	44,400	
Total:	91,104	2.8%
Recreation/Health		
Center 1	17,904	
Center 2	21,840	
Clinic	5,440	
Park	106,414	
Total:	151,598	4.7%
Parking – 394 stalls	157,700	4.9%
Project Area:	3,198,971	100.0%
Project Site:	986,100	(23 acres)

Chapter 9 – Conclusion

Through the studying of mixed-use, I have gained a better understanding of the building type along with the various public and private individuals involved; its impact on the immediate surroundings

and place within the community. Like other building types, a mixed-use project starts with an idea, but unlike other types it involves a complex matrix of public and private entities. These projects require extraordinary planning, management, and capital to complete. A goal for mixed-use is to create mutually supporting activities that will have a synergistic effect, thus creating a viable project for public and private parties involved and the community that it affects. Mixed-use projects are influenced by their site conditions, community goals and needs, timing, social and political issues, economic and local real estate market, land use controls, and financing.

Prior to the construction of a mixed-use project there are a number of factors that should be considered to decide the projects feasibility. The site in which a project is built should be thoroughly analyzed along with the community and their needs. Selecting an optimal site for the project that will have the best outcome for the community and investors is critical. Moreover an analysis of the local real estate market is essential to determine the type of uses that would be right for the project and community. Project feasibility would be critical in determining the realization of each mixed-use concept studied (Ewa, downtown Honolulu, and Mō'ili'ili).

Multiple concepts and development programs should be analyzed to optimize financing and deciding on the best option to build. Development costs, operating costs and projected revenues are estimated for each concept and program. Studies should also anticipate the demands of the local real estate market to calculate an appropriate development program. This can be difficult to manage due to the unexpected fluctuations in the real estate and economic markets. Office space may be a needed during one period but five years later when the project is complete, there may be less need for offices. These preliminary studies and feasibility tests can take time and resources. Although this process may be repetitive for each concept, it is imperative to minimize the risks of the mixed-use project in order to reduce the obstacles that may jeopardize success of the project.

The planning of the various functions can affect the efficiency of the mixed-use project. An appropriate design concept and program should be chosen to reflect the needs of the community and harmonize the project with its surroundings. Efficient planning of a mixed-use can create and strengthen existing circulation patterns throughout the development and neighborhood. Pedestrian connections should be improved to encourage walking and other modes of transportation and reducing the need for the automobile.

Parking is a critical factor in the mixed-use and can lead to the failure of the project. Mixed-use projects can bring a high volume of people and cars into the area. If a project is unable to accommodate people who visit by car, it may not be convenient for those individuals. A project that is in proximity to a transit stop can provide convenience for riders, while possibly reducing the need for people to travel by automobile. A mixed-use project when in relation to a transit station should conveniently offer access through all types of transportation (motorists, bicyclists, pedestrians, and transit riders).

There are also many social benefits of mixed-use. Mixed-use can improve social interaction among users through public activities and amenities. Various uses that are concentrated in a project area can promote socialization and convenience. Moreover it is important to introduce mixed-social classes into the project by providing a variety of housing types. This can help improve social connections between demographic groups and strengthen the community. This can be a challenge especially for people who are reluctant to live within the vicinity of affordable housing or lower social classes. How do we gentrify mixed-use to appeal to all social classes? The answer may be in the variety of uses that appeal to each class or the planning of the housing units to provide a separation of the various classes yet uniting each through public space. Various local and state authorities across the U.S. are beginning to offer density bonuses to developers who

include affordable housing in the mix. This can be part of the solution to encourage mixed-use and solve the affordable housing and homelessness crisis on O'ahu.

Mixed-use has high risk, due to the many uncertainties that it presents, but if these risks are minimized, the project can bring large profits for investors and developers. Mixed-use needs economic support during the construction phase and throughout the life of the project. It takes cooperation between public and private entities to complete a successful project. Developers have the task of reducing the risks and demonstrate sufficient returns in order to attract investors. Developers and investors need to carry the expenses for the project while it is under construction. "Each layer of new use adds more complication to a project, each additional use – vertical as opposed to horizontal mixed uses, additional developers, ground leases and so on – makes the project more complicated and less standard, which results in a higher cost of capital."⁹⁹ The risks involved are one reason why mixed-use developments can prove intimidating and cumbersome for those involved.

Providing a transit stop within the vicinity of a mixed-use project can help improve the pedestrian activity and reduce profit risks related to various uses in a development. The rail system provides greater mobility, creates connections and offers a place for people to gather (public space) which in turn spurs economic activity in the area.

Many possibilities can happen through the transit system. The optimal connection for a transit system is within a mixed-use development or transit-oriented development (TOD). A light rail system that stops within a TOD can connect directly into office, retail, or entertainment uses providing an avenue for perhaps thousands of people per day (such as in the case of the Mō'ili'ili mixed-use). People come and go at various times of the day, providing economic activity for the uses near the station.

⁹⁹ Schwanke, 2003, 96.

The transit station may also encourage residential, hotel, and office uses to form nearby. The transit system provides convenience and accessibility for people. People are inclined to live near a transit station, so that they can easily access other parts of the region. If a transit station is planned properly and can support a large population of transit riders, there is a greater possibility for foot traffic in the area and a place for social gatherings and public activities would follow.

In addition to studying the effects of mixed-use and mixed-use in relation to the transit system, the conditions of various contexts associated with transit and mixed-use were also examined. Three distinct conditions on Oahu were selected: suburban, urban, and neighborhood. Comparing the three sites and projects helped me understand the various components of mixed-use along with the needs of each community and Honolulu. This study is also important in understanding the application of the mixed-use solution within the existing contexts of each site and mixed-use in general.

In each community, there are needs and challenges. Each site has the common need of providing housing for residents and reducing traffic. To determine the needs of each community a survey was completed of the existing uses within a fifteen minute radius of each project site. This estimated distance is based on the area in which the mixed-use is predicted to serve. In the case of Ewa, it is a greenfield site and unauthorized entry on to the site was prohibited. The design for the Ewa scheme was based on the high residential population of the Ewa Villages and Ewa by Gentry districts. The land use plan provided by DR Horton also played a factor in the design and program. The issue of traffic and housing in Honolulu were also considered in each design along with the exploration of various configurations for mixed-use. Here are a few goals for each project:

Ewa:

1. Provide affordable housing; mixed-housing
2. Provide a place for the community through public space and retail situated in proximity of the transit stop.

Downtown Honolulu:

1. Provide additional residences; mixed-housing
2. Improve Honolulu's waterfront

M 'ili'ili:

1. Connect the University of Hawaii to the community.
2. Provide a center for the community and university by providing retail commercial use to support the large residential population.
3. Provide senior living residences
4. Provide additional student housing; to reduce or eliminate the need for dormitories in Waikiki.

The "right amount" of population is critical to the success of the mixed-use project and community. A large residential use is provided in the downtown and M 'ili'ili solutions. This high volume of residences could concentrate the population growth within the urban core. Compact mixed-use in the case of downtown and M 'ili'ili could also encourage additional mixed-use projects in the area.

Retail spaces in each site are used to provide connections between the various components of the project. These areas in each condition serves as a place for working individuals,

socialization, and economic stimulation. Office spaces were also important in each mix to provide activity during the day hours. M 'ili'ili has the highest volume of office space followed by Ewa and downtown Honolulu. Office space provides activity within the mixed-use from 8 am to 5 pm. Office employees are "fixed" within the mixed-use during this period, while retail space invites users throughout the day and mid-evenings. The downtown program included hotel within the mix to allow business visitors an opportunity to stay within proximity of central downtown.

Each design solution is highlighted through public space. The Ewa mixed-use featured public activities at the ground level and a semi-public space for residents and office employees. Retail, office, entertainment, and recreation spaces within the mixed-use could be utilized as public domains.

The downtown MXU amplifies existing pedestrian connections while building new ones. In this scheme the waterfront is used to add pedestrian and vehicular patterns throughout the site. Vehicular traffic is only allowed to penetrate the project at Mauna Kea Street and Nimitz Highway where the parking garages are located.

M 'ili'ili builds upon existing connections while minimizing vehicular traffic within the project boundaries. The main pedestrian avenue provides a 'grand' entry into the University of Hawaii. This serves as a spine where other uses are featured. There is also access directly into the University's Athletic Complex from the transit platform.

Mixed-use projects are also subject to a greater volume of challenges than other building types. Here are a few anticipated challenges for each site:

1. Getting community support for mixed-use; educating people on the advantages of mixed-use and or transit-oriented development.
2. Financing from public and private donors
3. Environmental impact/ opposition from environmentalists

4. Parking and traffic during the construction phase of the project.
5. Obtaining the parcel(s) for the mixed-use development. In the case of M 'ili'ili there are multiple property owners for the proposed mixed-use site.

Mixed-use in Honolulu will impact the local economy. During the duration of the Honolulu transit project, it is expected that it will create 9,100 jobs. This could provide a boost in Honolulu's economy while increasing the demand for housing for workers who migrate to Honolulu from the mainland. Hawaii lacks some of the necessary skills to build the rail system and will probably rely on mainland specialists.¹⁰⁰

Mixed-use will also bring jobs for residents of Honolulu. A portion of those jobs could go to residents who live within the mixed-use development. This could result in transportation savings for those individuals and reduction in automobile traffic.

Property values can also expect to jump due to the MXU. Residential units within the complex can cost more than the average of a typical unit within the community. Adjacent properties can also expect an increase in pedestrian traffic and that can boost sales for local businesses. This may result in property sales and other properties being converted into mixed-use.

Honolulu could benefit from the many advantages of mixed-use. Mixed-use is already a trend in many other parts of the world. Honolulu can learn from these areas in order to establish mixed-use projects that are unique to each community and culture of the Islands. As population numbers on O'ahu grow in the future, the city will need to consider how to sustain its population. Mixed-use and Honolulu's mass transit system can be a solution to Honolulu's growing traffic and housing problem. Mixed-use in Honolulu will only be possible through an ambitious group of

¹⁰⁰ Hao, Sean. *Hawaii rail project may create 9,100 jobs*. (Honolulu Advertiser: February 17, 2008)

individuals with an agenda to change the built environment for the betterment of O'ahu residents.

We can only wait and see.

Bibliography

- Baltanas, Jose.
Walking Through Le Corbusier: A Tour of his Masterworks. London: Thames & Hudson, 2005.
pp. 112-135.
- Beatley, Timothy.
Green Urbanism: Learning from European Cities. Washington D.C.: Island Press, 2000.
- Doordan, Dennis P.
Twentieth-Century Architecture. New Jersey: Prentice Hall, 2001.
- Futagawa, Yukio ed.
"Le Corbusier, L'Unite d'habitation, Marseille, France". Global Architecture Document #18, Japan: A.D.A Edita Tokyo Co, 1972.
- Futagawa, Yukio ed.
"*Piano and Rogers: Centre Beaubourg*". Global Architecture Document #44, Japan: A.D.A Edita Tokyo Co, 1972.
- Futagawa, Yukio ed.
"*International 2004: Steven Holl Beijing Looped Hybrid*". Global Architecture Document #79, Japan: A.D.A Edita Tokyo Co, 2004, pp.90-95.
- Jacobs, Jane.
The Death and Life of Great American Cities. New York: Random House, 1961.
- Kilham, Walter H.
Raymond Hood, Architect: Form through Function in the American Skyscraper. New York: Architectural Book Publishing Co., 1973. pp. 164-170
- Kostof, Spiro.
A History of Architecture: Settings and Rituals. New York: Oxford University Press, 1995.
- Pollack, Naomi R.
"*Tokyo Midtown*". Architecture Record (New York City: The McGraw-Hill Companies, November 2007, vol. 195, No.11) pp. 122-149.
- Rogers, Richard.
Cities for a Small Planet. Boulder: Westview Press, 1997.
- Schaffer, Kristen.
Daniel H. Burnham: Visionary Architect and Planner. New York: Rizzoli, 2003. pp.122-127.

Schwanke, Dean, et al.

Mixed-Use Development Handbook. Second Edition. Washington D.C.: ULI-The Urban Land Institute, 2003.

Siry, Joseph M.

The Chicago Auditorium Building: Adler and Sullivan's Architecture and the City. Chicago: University of Chicago Press, 2002.

Tibbalds, Francis.

"Making People-Friendly Towns: Improving the Public Environment in Towns and Cities." New York: Spon Press, 2001.

Witherspoon. Robert E., Abbett, Jon P., Gladstone, Robert M.

"Mixed-Use Developments: New Ways of Land Use." Washington DC, ULI-the Urban Land Institute 1976. pp.3 - 98

'Flatiron Building'

http://en.wikipedia.org/wiki/Flatiron_Building (accessed: Nov.4.2006)

'Office for Metropolitan Architecture' <http://www.oma.nl/> (accessed: Sept.30.2006)

'Steven Holl Architects: Beijing Looped Hybrid'

http://www.arcspace.com/architects/Steven_Holl/beijing/index.htm (accessed: Nov.3.2006)

Illustration Credits

Fig.1 Rogers, Richard. *Cities for a Small Planet*. (Boulder: Westview Press, 1997) 4.

Fig.2 Kostof, Spiro. *The Rise of the City: Architecture in Western Asia*. A History of Architecture: Settings and Rituals. (Oxford: Oxford University Press, 1995), 51.

Fig.3 Xujie, Liu. *Chapter 1: The Origins of Chinese Architecture*. Chinese Architecture (Connecticut: Yale University and New World Press, 2002), 34.

Fig.4 Kostof, Spiro. *The Rise of the City: Architecture in Western Asia*. A History of Architecture: Settings and Rituals. (Oxford: Oxford University Press, 1995), 205.

Fig.5 <http://www.itlwork.net/pages/portfolio/speculations/newsb.html> (accessed: Jan.2.2008)

Fig.6 Rogers, Richard. *Cities for a Small Planet*. (Boulder: Westview Press, 1997).

Fig.7 Schaffer, Kristen. *Daniel H. Burnham: Visionary Architect and Planner*. (New York: Rizzoli, 2003) 122.

Fig.8 http://en.wikipedia.org/wiki/Flatiron_Building (accessed: Nov.4.2006)

Fig.9 http://images.google.com/imgres?http://wallpapers.diq.ru/wallpapers/63/Rockefeller_Center (accessed: Nov.8.2006)

Fig.10 Onishi, Kekoa. View of Rockefeller Center Rink (taken: Feb.8.2006)

Fig.11 Baltanas, Jose. *Walking Through Le Corbusier: A Tour of his Masterworks*. (London: Thames & Hudson, 2005) 112.

Fig.12 Baltanas, Jose. *Walking Through Le Corbusier: A Tour of his Masterworks*. (London: Thames & Hudson, 2005) 113.

Fig.13 Baltanas, Jose. *Walking Through Le Corbusier: A Tour of his Masterworks*. (London: Thames & Hudson, 2005) 114.

Fig.14 Baltanas, Jose. *Walking Through Le Corbusier: A Tour of his Masterworks*. (London: Thames & Hudson, 2005) 115.

Fig.15 *Beijing Looped Hybrid*. http://www.arcspace.com/architects/Steven_Holl/beijing/index.htm (accessed: Nov.3.2006)

Fig.16 Beijing Looped Hybrid plan. Futagawa, Yukio ed. *"International 2004: Steven Holl Beijing Looped Hybrid"*. Global Architecture Document #79, (Japan: A.D.A Edita Tokyo Co, 2004) 94.

Fig.17 *Tokyo Midtown*. Architecture Record November 2007, vol.195, No.11, p.123.

Fig.18 Site 21_21 designed by Tadao. <http://en.wikipedia.org/wiki/Image:Site2121.jpg> (accessed: Nov.17.2007)

Fig.19 *Tokyo Midtown overall view*. Architecture Record November 2007, vol.195, No.11, p.122.

Fig.20 *Honolulu Transit Corridor*. (http://honolulutransit.org/project_overview/) (accessed: Nov.10.2007)

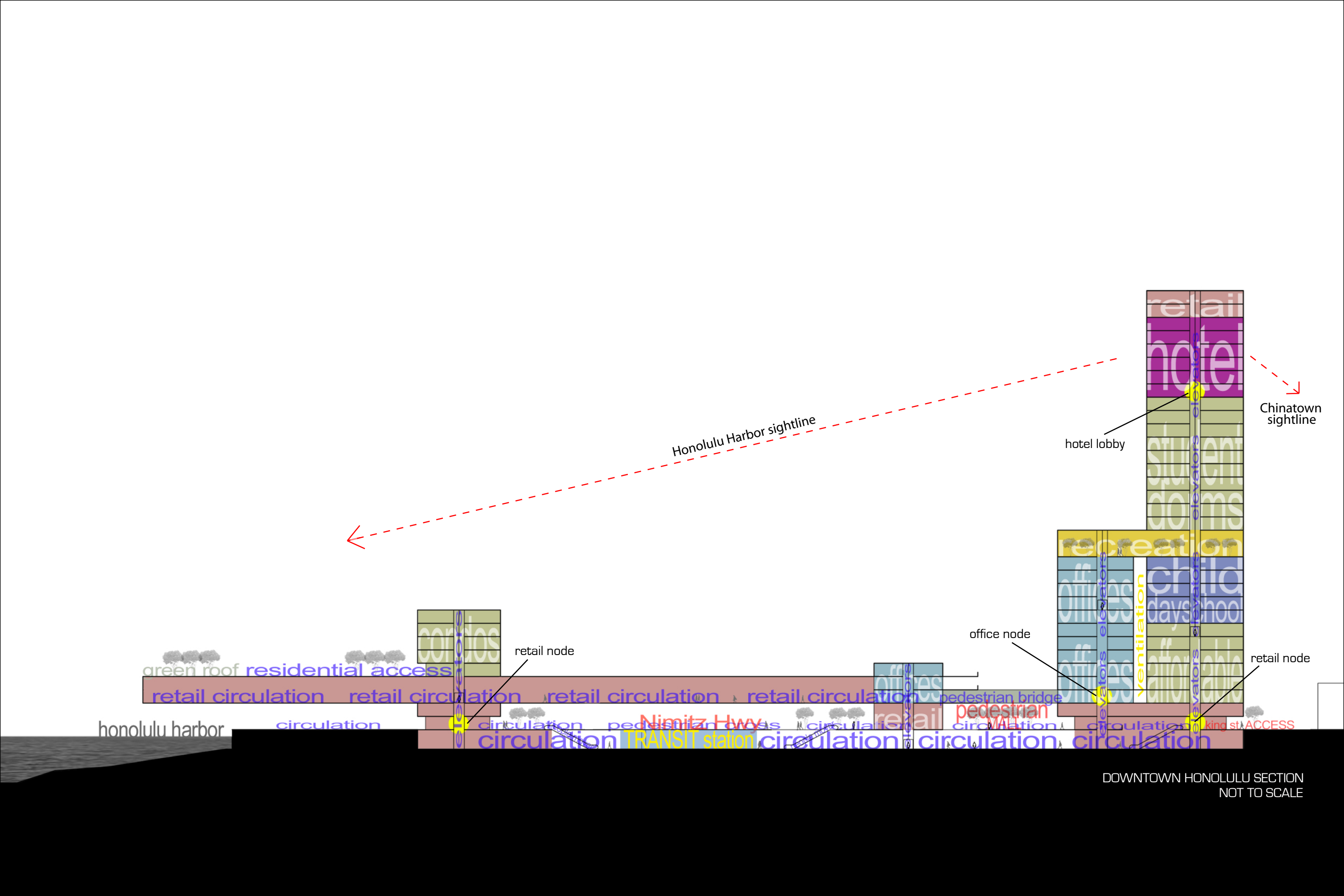
Fig.21 H. Rabinowitz and E. Beimborn. *The New Suburb, Technology Sharing Program*. (Washington D.C.: U.S. Department of Transportation, 1991)

Fig.22 *Renovated Plantation House*. (http://www.architectdesign.com/arch_tips_ewa.html) (accessed: Nov.10.2007)

Fig.23 Onishi, Kekoa. *Downtown Honolulu existing uses within fifteen-minute walk*.

Fig.24 *Moiliili Cave*. Ruby, Laura. *Moiliili – The Life of a Community*. (Honolulu: Moiliili Community Center, 2005)

Fig.25 Onishi, Kekoa. *Moiliili existing uses within fifteen-minute walk*.



- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION

RIVER ST.

KENAUKE ST.

MAUNAKA ST.

SMITH ST.

S KING ST.

S HOTEL ST.

NUUANU AVE.

S. PAUHAH ST.

S. BERETANIA ST.

BETHEL ST.

FORT ST. MALL

BISHOP ST.

QUEEN ST.

MERCHANT ST.

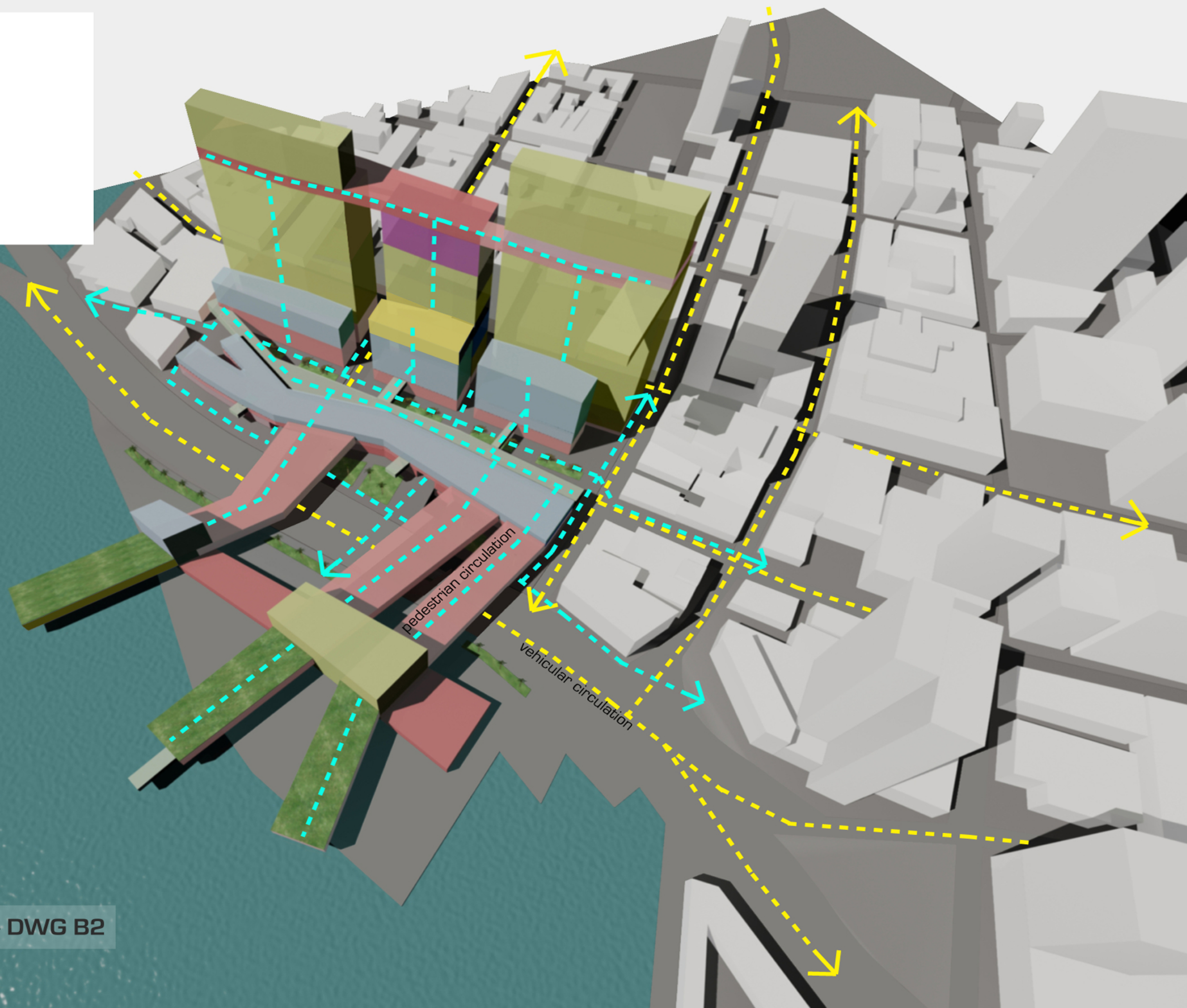
transit line
underground



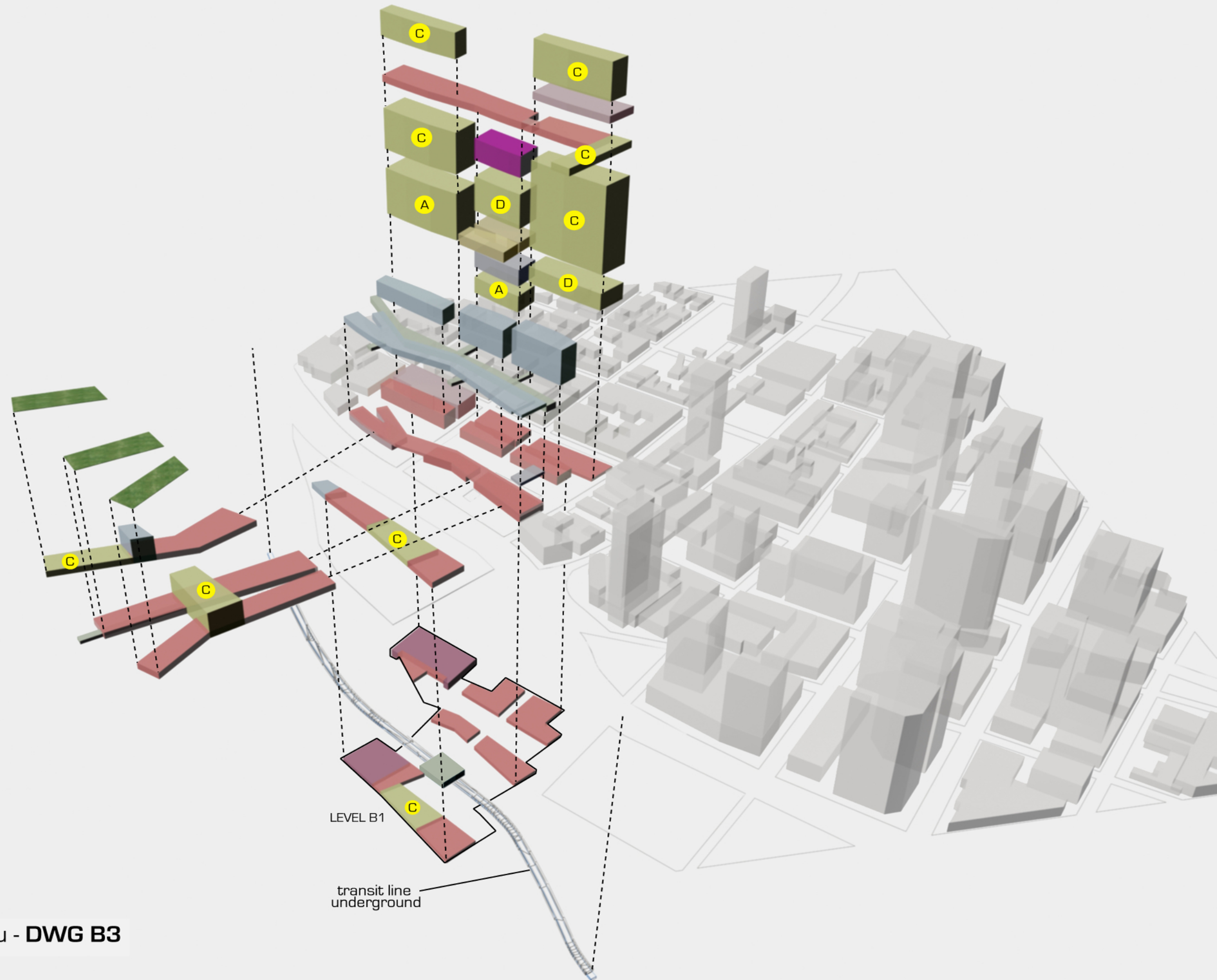
Downtown Honolulu - DWG B1

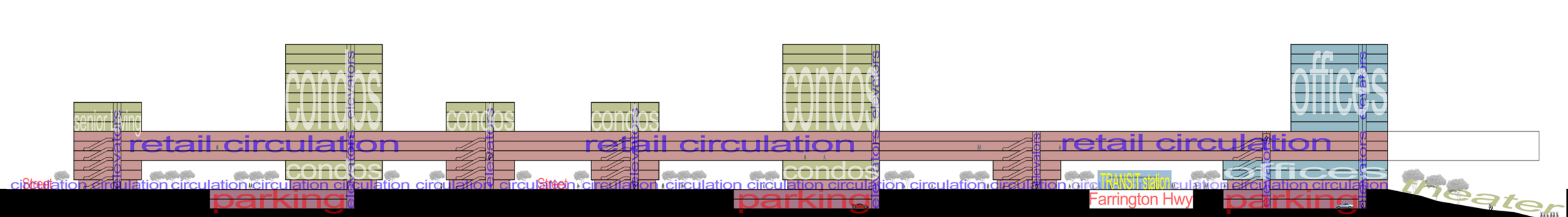


- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION



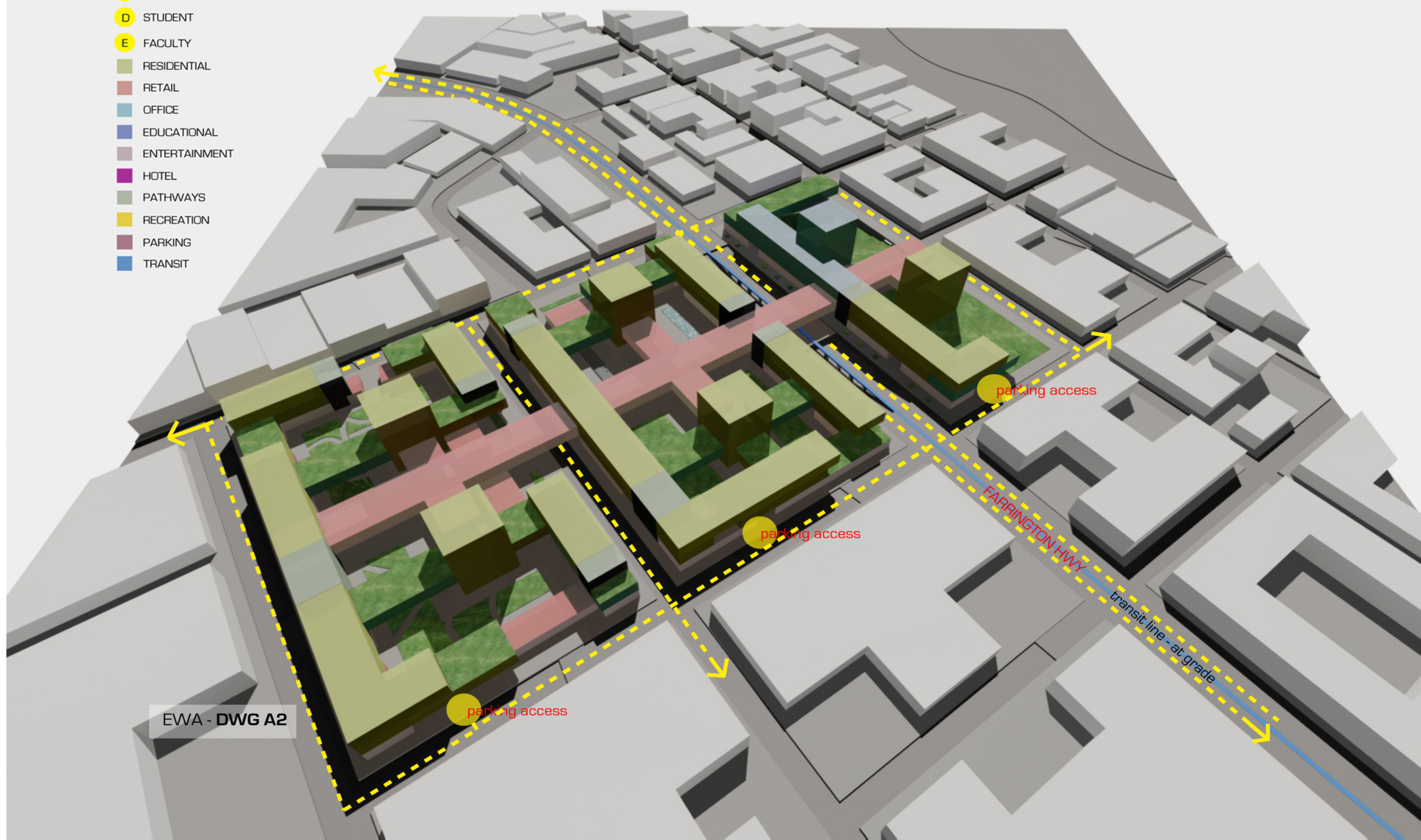
- A AFFORDABLE
- B SENIOR LIVING
- C CONDOMINIUM
- D STUDENT
- E FACULTY
- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION
- PARKING





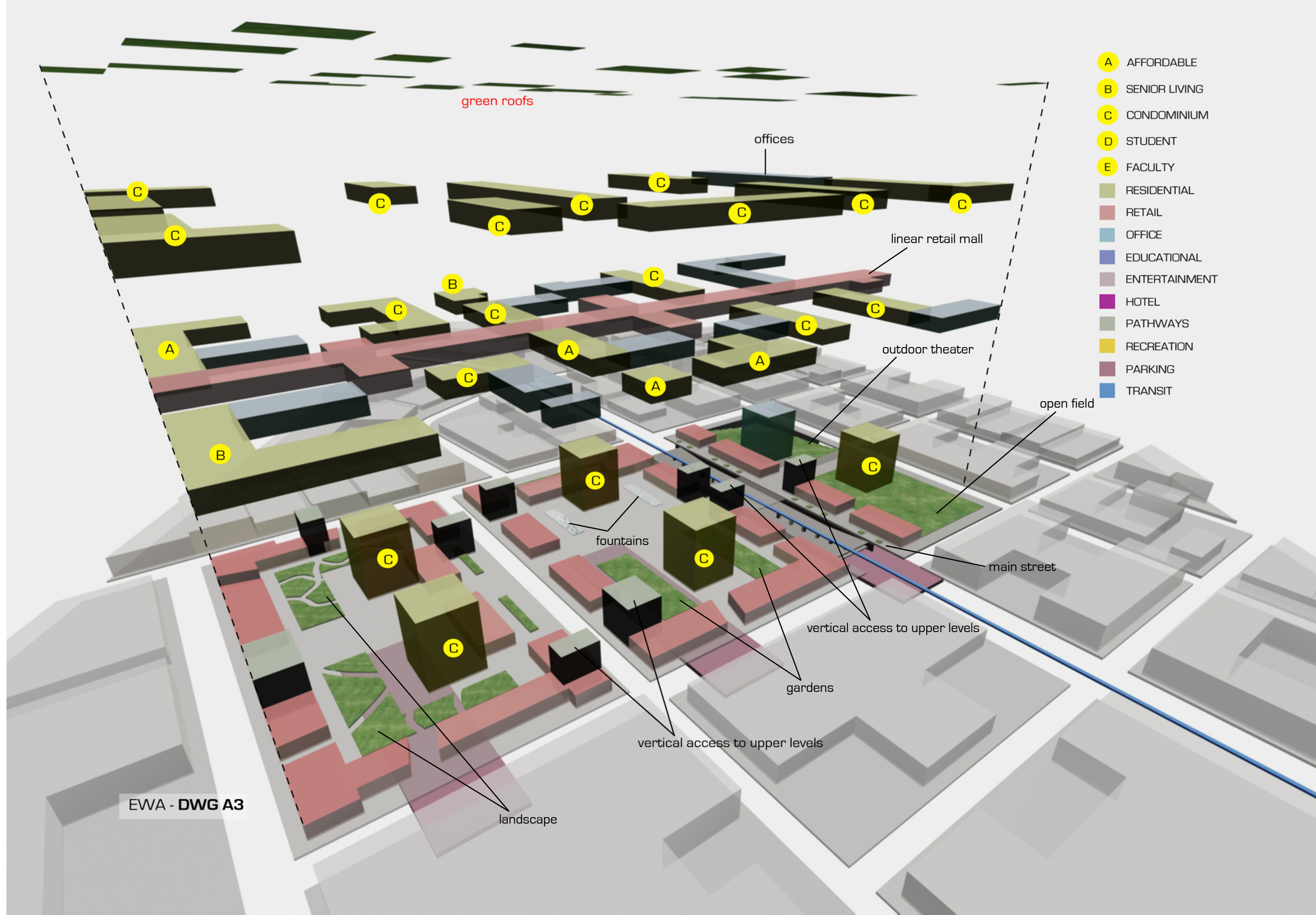
EWA SECTION
NOT TO SCALE

- A AFFORDABLE
- B SENIOR LIVING
- C CONDOMINIUM
- D STUDENT
- E FACULTY
- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION
- PARKING
- TRANSIT



EWA - DWG A2

FARRINGTON HWY
transit line - at grade



green roofs

offices

linear retail mall

outdoor theater

open field

main street

vertical access to upper levels

gardens

vertical access to upper levels

landscape

EWA - DWG A3

- A AFFORDABLE
- B SENIOR LIVING
- C CONDOMINIUM
- D STUDENT
- E FACULTY
- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION
- PARKING
- TRANSIT

- A AFFORDABLE
- B SENIOR LIVING
- C CONDOMINIUM
- D STUDENT
- E FACULTY
- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION
- PARKING
- TRANSIT



EWA - DWG A1



RESIDENTIAL

RETAIL

OFFICE

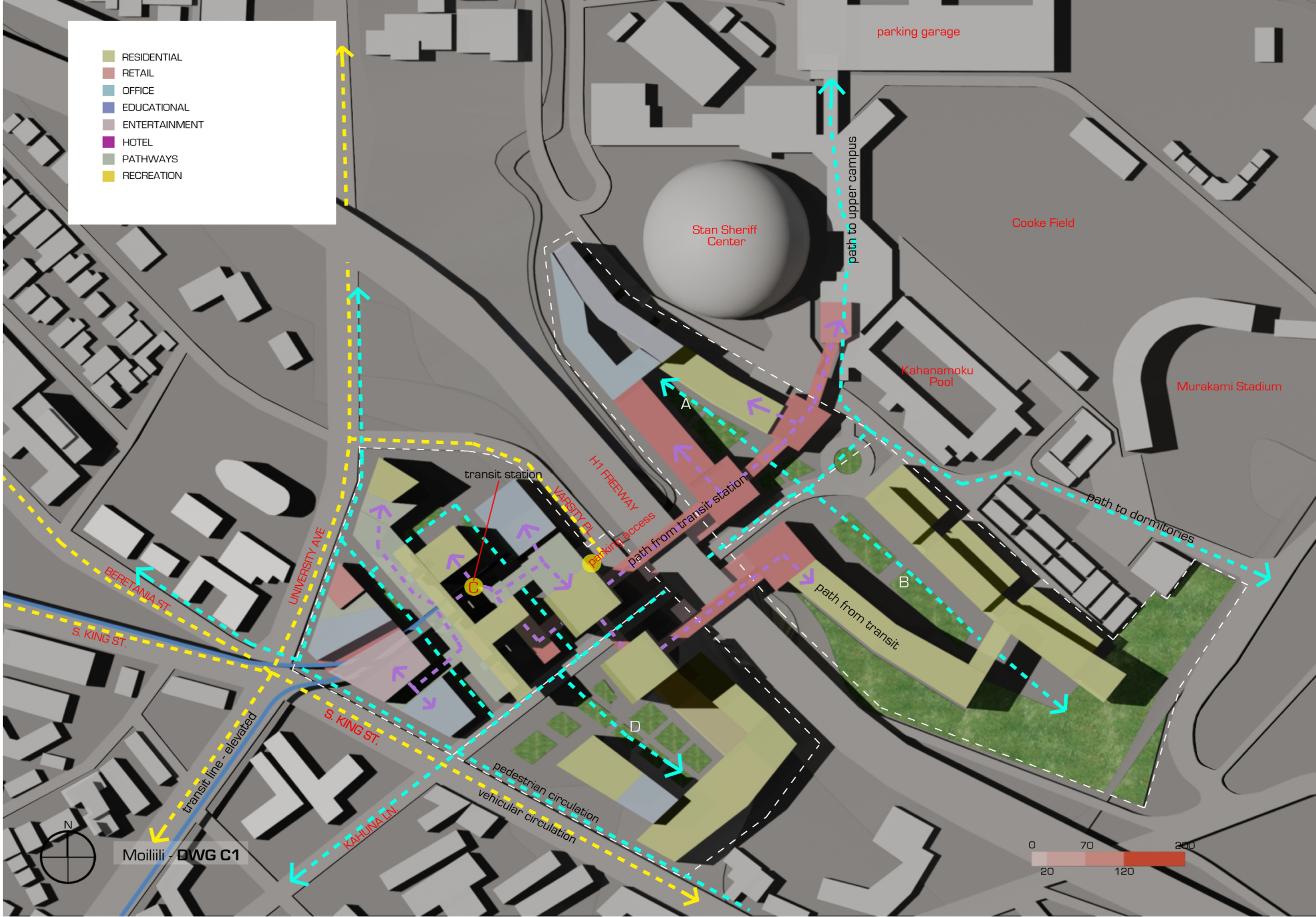
EDUCATIONAL

ENTERTAINMENT

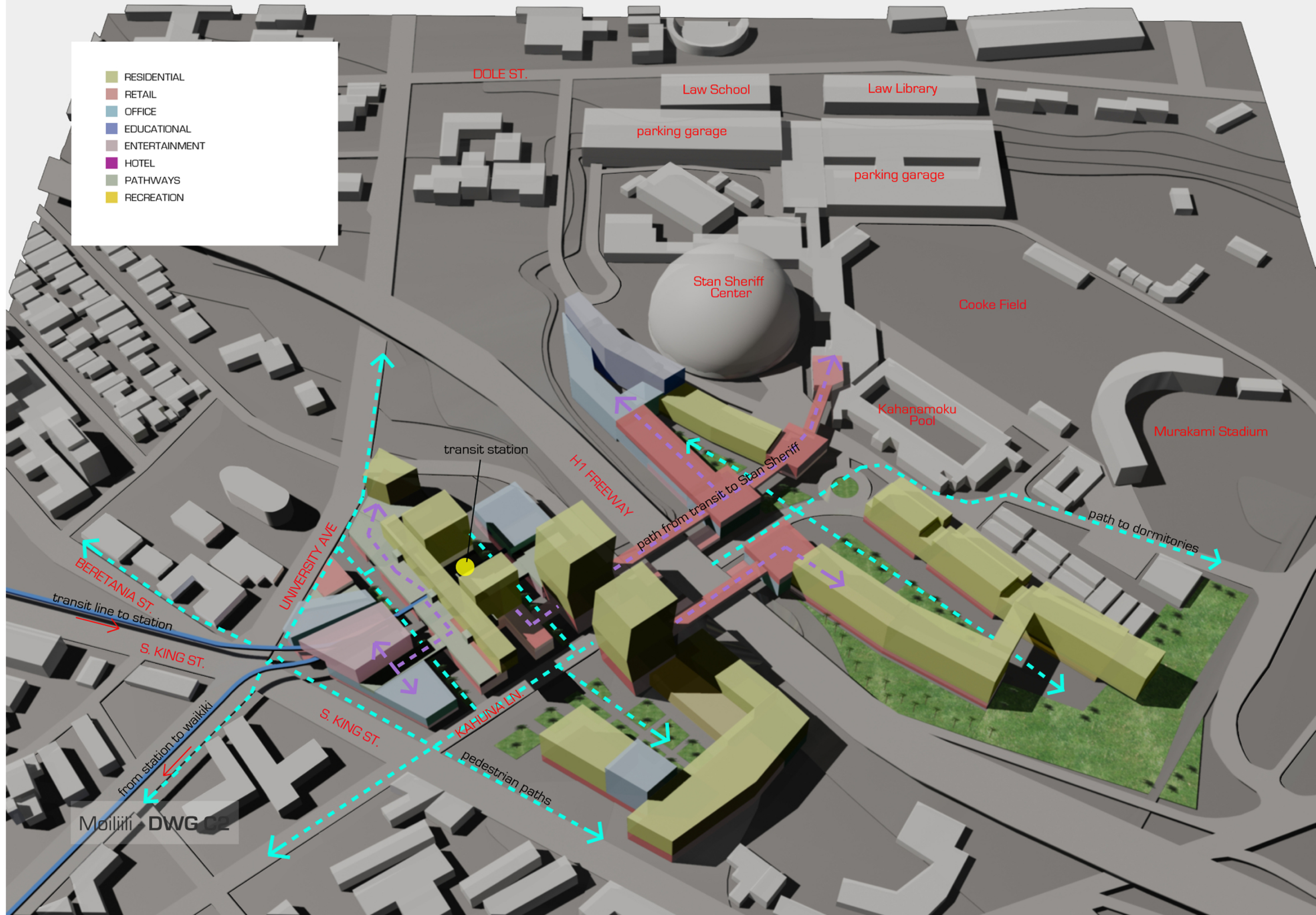
HOTEL

PATHWAYS

RECREATION

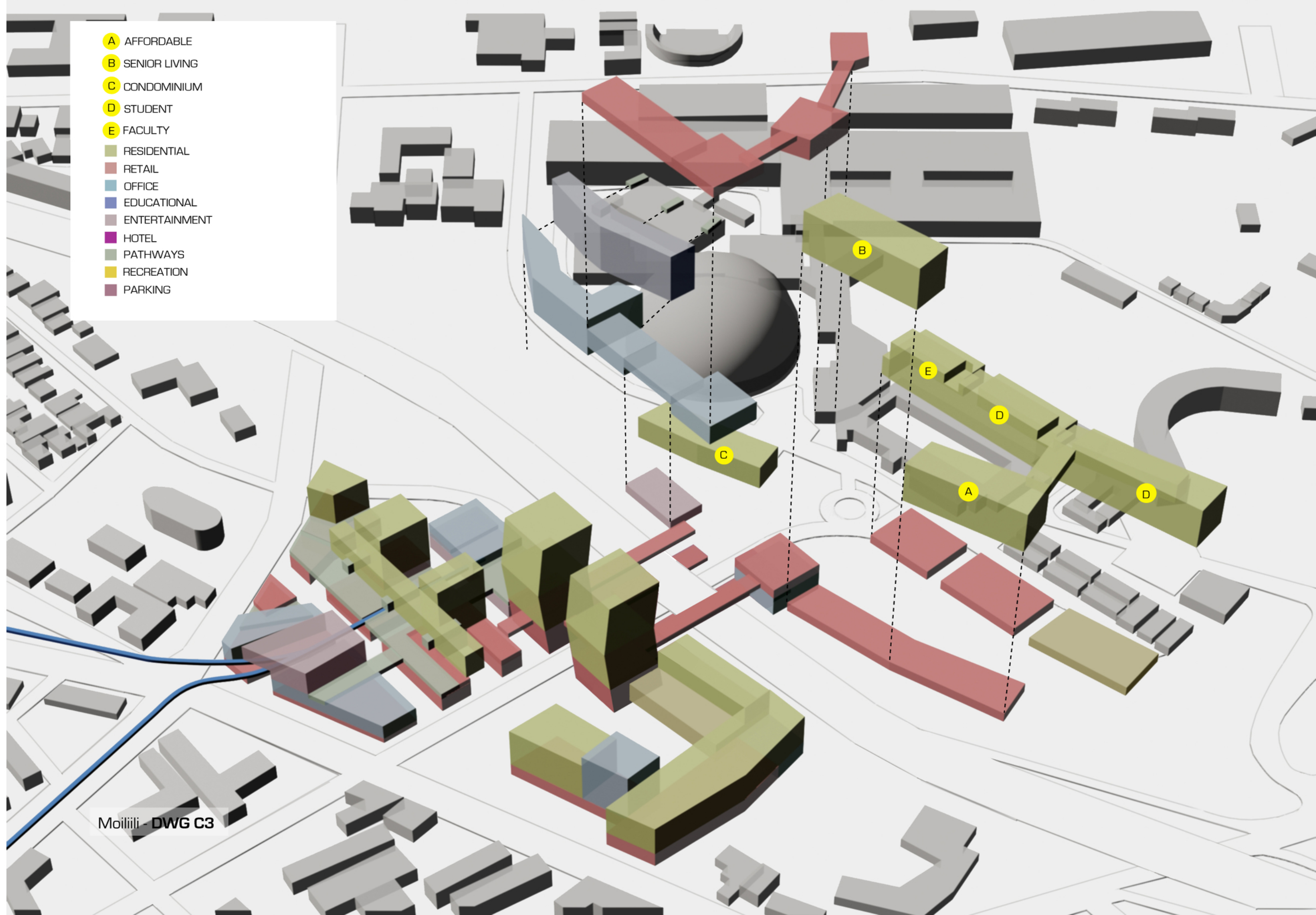


- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION



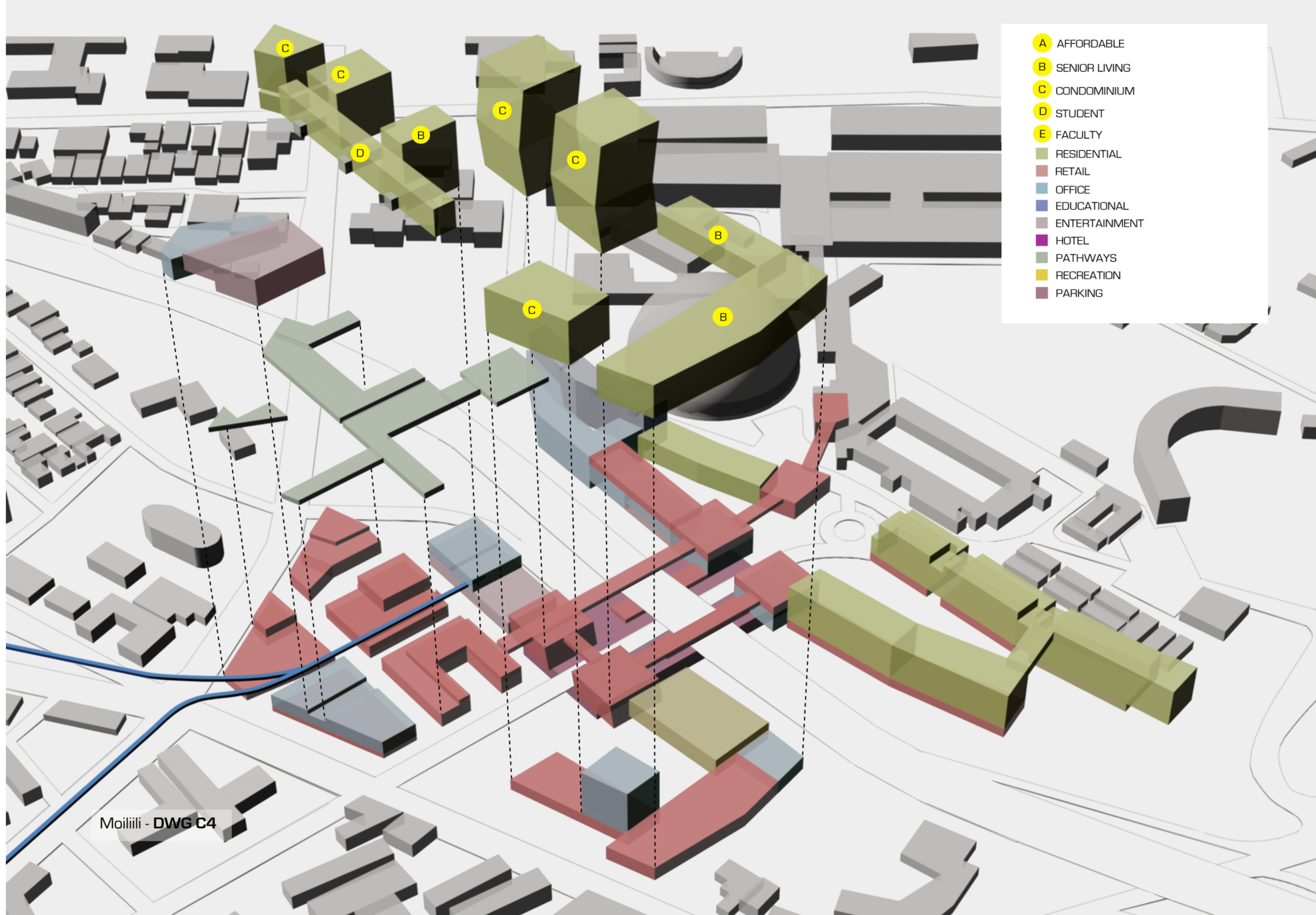
- A AFFORDABLE
- B SENIOR LIVING
- C CONDOMINIUM
- D STUDENT
- E FACULTY
- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION
- PARKING

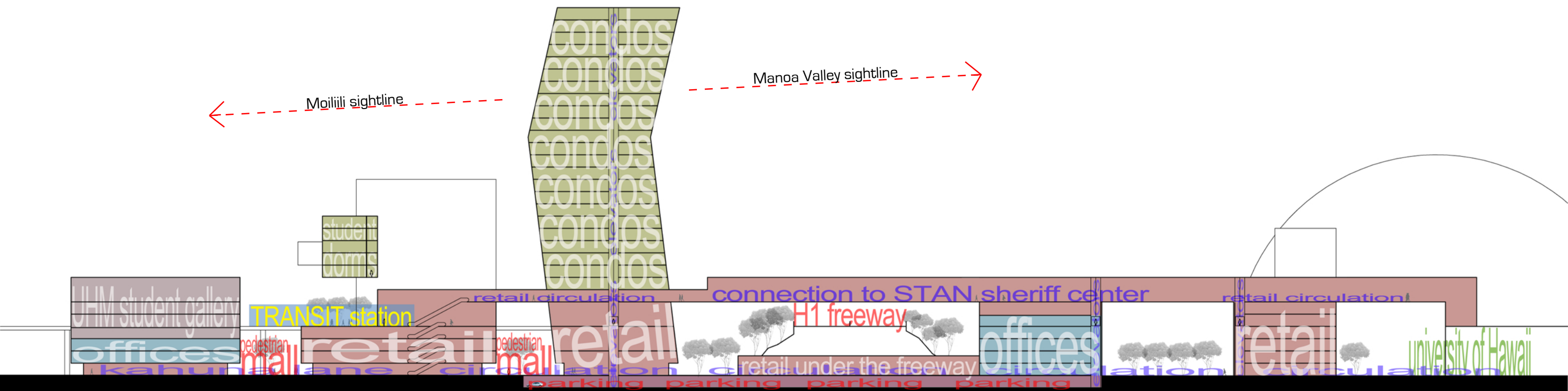
Moiliili - DWG C3



- A AFFORDABLE
- B SENIOR LIVING
- C CONDOMINIUM
- D STUDENT
- E FACULTY
- RESIDENTIAL
- RETAIL
- OFFICE
- EDUCATIONAL
- ENTERTAINMENT
- HOTEL
- PATHWAYS
- RECREATION
- PARKING

Moilili - DWG C4





MOILIILI SECTION
NOT TO SCALE